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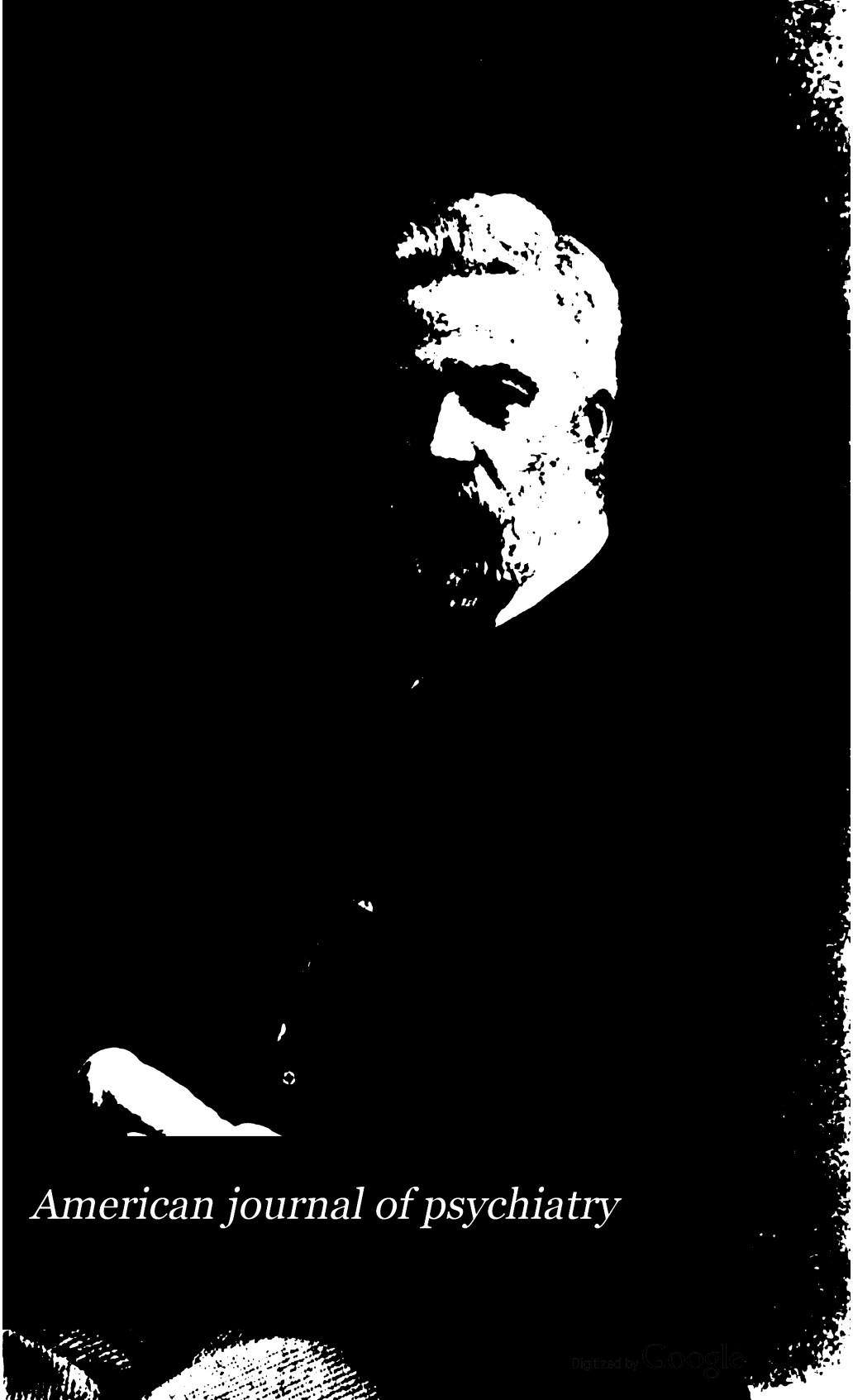
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THE
AMERICAN
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THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION

EDITORS

Henry M. Hurd, M. D. G. Alder Blumer, M. D.
Edward N. Brush, M. D. J. Montgomery Mosher, M. D.

VOLUME LIV

"The care of the human mind is the most noble branch of medicine."—GROTIUS.

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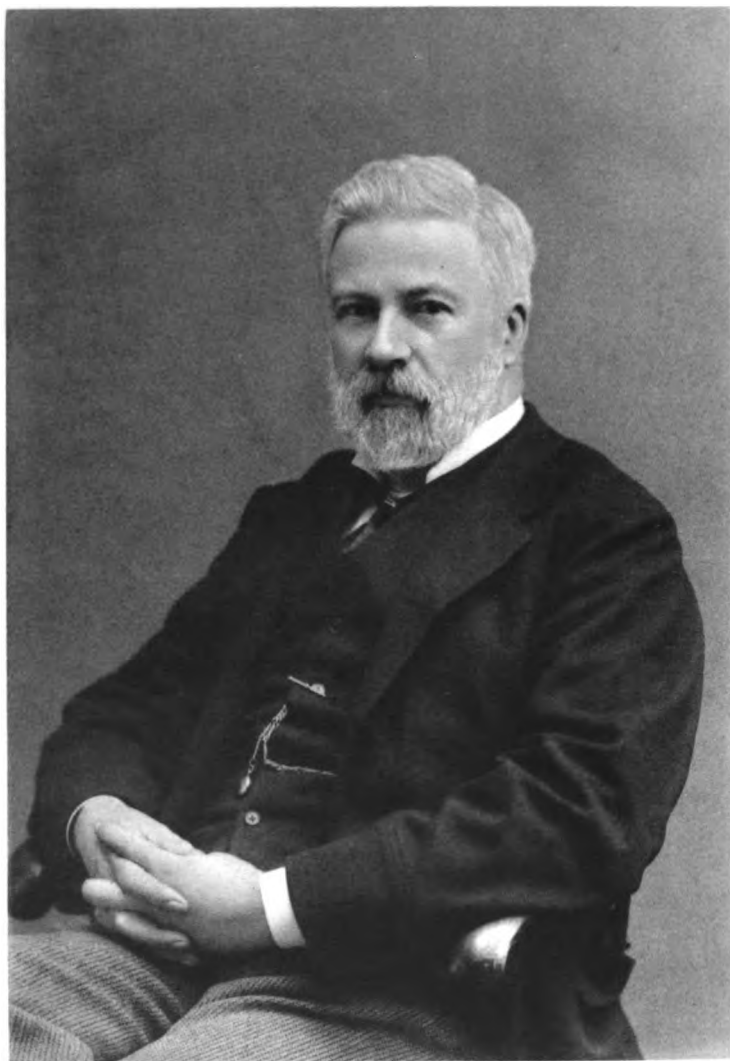
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G. Fielving Blandford

AMERICAN JOURNAL OF INSANITY

ADVANCES IN NEUROLOGY AND THEIR APPLICATION TO PSYCHIATRY.

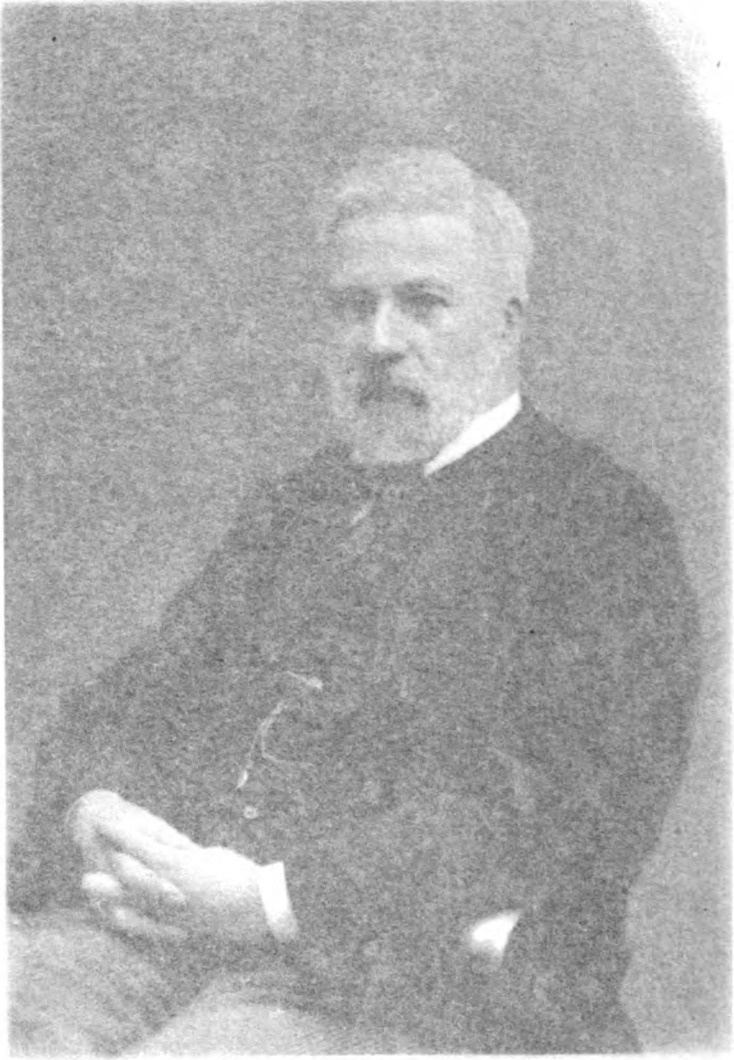
By B. SACHS, M.D.,

Professor of Mental and Nervous Diseases in the New York Polytechnic, et

Members of the Association:—Your kind invitation to deliver before you an address which shall bear upon some subject of interest to all of us has been accepted most willingly, with a full consciousness of the honor thus conferred, and the responsibilities it entails upon me. You have summoned; I must obey; and in the spirit of obedience find my excuse for venturing to present to you a few reflections upon matters which have surely attracted the serious attention of every member of this association. In wishing to promulgate any startling doctrines, I may perhaps be tempted to formulate my reflections on the supposition that even the most established facts may at times be repeated for the sake of the lesson which is intended to convey.

A few of recent experiences, indeed too recent to be entirely forgotten, when you have evinced considerable courage in inviting a neurologist to appear before you. Evidently you are desirous of concealing that there is a "state of war" between neurologists and alienists. Far from being foes or even antagonists, we are struggling for a common cause and should be united against the common enemy—the diseases of the nervous system.

Original Address delivered before the American Medico-Psychological Association at Baltimore, May 12, 1897.



Charles Standford

AMERICAN JOURNAL OF INSANITY

ADVANCES IN NEUROLOGY AND THEIR RELATION TO PSYCHIATRY.¹

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Members of the Association:—Your kind invitation to deliver before you an address which shall bear upon some subject of interest to all of us has been accepted most willingly, with a full sense of the honor thus conferred, and the responsibilities it entails, upon me. You have summoned; I must obey; and in this act of obedience find my excuse for venturing to present to you a few reflections upon matters which have surely engaged the serious attention of every member of this association. Without wishing to promulgate any startling doctrines, I may be permitted to formulate my reflections on the supposition that even familiar facts may at times be repeated for the sake of the lesson they are intended to convey.

In view of recent experiences, indeed too recent to be entirely forgotten, you have evinced considerable courage in inviting another neurologist to appear before you. Evidently you are not willing to concede that there is a "state of war" between neurologists and alienists. Far from being foes or even antagonists, we are struggling for a common cause and should be united against the common enemy—the diseases of the nervous

¹ The Annual Address delivered before the American Medico-Psychological Association at Baltimore, May 12, 1897.

system. Do what we will, we cannot separate diseases of the mind from the organic diseases of the brain and of the spinal cord. No one can be thoroughly devoted to a study of the latter class without at the same time taking a deep interest in psychiatry. I have no doubt that others, like myself, would never have entered the ranks of neurologists if they had not been impelled to the study of nervous affections by a special fondness for the analysis of mental conditions. If there be any differences between us, we must concede that you are our superiors, at least etymologically. As *psychiatrists* you are healers of the soul, while we *neurologists* are mere students of the nervous system. Your aim would appear to be a higher one, but I am certain, now that an "entente cordiale" has been established, that you will be amiable enough to allow that we, too, heal a patient or two every now and then, or if we do not succeed, we are constantly engaged in making desperate therapeutic efforts. It is your privilege to be devoted to the noblest of all specialties, if nobility be gauged by the dignity of the organ whose disturbed function comes within your special province. We neurologists have a speaking acquaintance, as it were, with diseases of the mind, and while we envy you the opportunity that you have of studying the patients and their morbid manifestations through the entire period of disease, we have an occasional advantage over you in seeing the patients in the very earliest period of the disease and in being able to study a goodly number of those who never reach the asylum door. Our studies can, therefore, supplement those made at your institutions, for in spite of all the advances of the day, the importance of clinical observation, carefully recorded, should not be underrated.

One of the foremost alienists¹ of Europe has said that psychiatry is at this day on the level of the medical sciences of a hundred years ago; that it is based wholly upon clinical studies and not upon a knowledge of the pathological anatomy of the diseased organ. Granted that this is true, and it is true in a limited sense only, the accusation cannot be construed as a reproach to those of us who are devoted to the study of mental diseases. It is simple proof that the clinical observation is far more difficult than in any other series of organic diseases, and that the structure

¹ Wernicke, Grundriss der Psychiatrie, Leipzig, 1894.

of the brain is so complex that its morbid pathology cannot, with the aid of past and present methods, be studied as easily as the changes that occur with diseases of the heart, the lungs, the liver, and the spleen. Nor is it desirable that careful clinical studies of the various psychic disorders should be discontinued or discouraged, for it may confidently be predicted that, in spite of the promises held out by the psychologist and the anatomist, further progress in psychiatry will depend in no small degree upon the most detailed studies of the insane in all their varying moods and conditions. We have at all times received valuable aid from physiologists and psychologists, and we acknowledge gratefully the value of their services which have helped us to determine the proper methods of analyzing morbid mental phenomena. It is equally true that the alienist may be able to furnish many a hint to the psychologist which he should be willing to adopt, however elevated his station may be over that of the ordinary mortal. The study of the evolution of language was not satisfactorily advanced until the *dissolution* of speech by disease shed a flood of light upon the nature of speech processes; just so the character of our common mental processes will become more intelligible to us if we analyze with the greatest care the *dissociation* of ideas as evidenced in various mental diseases. What a harvest there would be for any one who would have the patience to record the morbid psychology of general paresis, of paranoia, and of acute mania!

It is a pleasure to be able to assert that the asylum physicians both here and abroad are thoroughly alive to their duties as physicians and clinical teachers. There is ample evidence also that the alienists are making every endeavor to solve the mysteries of the morbid anatomy of insanity, and your asylum reports are fast becoming storehouses of useful inquiries into the morbid anatomy of the brain. The pathological report issued only a few months ago by the Illinois Eastern Hospital for the Insane deserves a special mention for the excellence of its studies, and the work of Dr. Meyer should be emulated by the pathologists of other institutions. In my own State the importance of pathological work has been recognized by the creation of a State laboratory. Under its efficient chief (Dr. Van Gieson), excellent work is certain to be done there, but it will not be amiss to sug-

gest in this connection that if the State institutions are to be truly benefited by such a central laboratory the younger asylum physicians should be detailed at stated periods for a course of study in pathological anatomy. And such studies should be conducted in a broad and generous spirit; I was almost tempted to say, conducted in the good old-fashioned ante-Koch days, not so much with a view of finding support for doubtful theories, as of giving the physician a thorough knowledge of the fundamental facts of pathology which shall enable him safely to interpret clinical data in their relation to the morbid changes underlying disease. A State laboratory should also, to my thinking, not wholly supplant pathological work to be done in the asylum itself. The full value of such work can be appreciated best by those who have had an intimate knowledge of the manifestations of the disease which have been due to the special findings in a given case. It is proper, too, that those forms of mental disease which are attended by tangible morbid changes should be studied first. In the excellent report referred to before, senile dementia, general paresis, terminal dementia, and alcoholic insanity have been considered in creditable detail and have yielded some positive results. In time to come the acute insanities and paranoia may also yield equally definite findings. We cannot hope to climb to the top of the ladder at once, and must therefore be content to establish the coarser changes in a few diseases. We should not be in too great haste to establish auto-toxic and other forms of insanity, lest in so doing we disregard the commonest changes in the ordinary forms of insanity. The direction in which the study of the morbid pathology of insanity is to be pushed will be determined best after a short survey of the mechanism by which normal mental action is effected.

We may start with the statement that the cerebral cortex is the organ of mind and that diseases of the mind are due to lesions in the cortex. There may be a difference of opinion as to whether the lesions are organic or functional; but whatever the nature of the disturbance may be, it is generally a diffuse lesion in contradistinction to the localized processes that occur in organic diseases of the brain; yet there are some forms of mental derangement, general paralysis and syphilitic dementia, in which the morbid process is both diffuse and tangible. It is doubtful

whether the entire cortex need be involved in any case of mental disease, and certain it is that there are definite portions of the cortex which have more important relations to mental processes than other regions have, as is proved by the development of idiocy in animals deprived of their frontal lobes and by the more frequent occurrence of psychic symptoms with tumors in the anterior third of the brain. It is also worthy of note that in the idiocies of childhood the mental defect is relatively greater if the frontal lobes have been involved in disease or are mal-developed than if the lesion or the defect occurs in the parietal or occipital regions. Large porencephalic defects in the parietal areas are compatible with a tolerably high mental development, whereas a defective development of the frontal lobes leads to complete idiocy even though the remainder of the hemispheres has attained to normal growth. These differences in the relation of the different parts of the hemispheres to the organ of mind have received much attention during the past few years. Some of the doctrines recently promulgated we can accept, others we must reject.

It was the genius of Meynert¹ that conceived of the cortex as a hollow sphere upon which the impressions of the outer world were projected and in which they were perceived. These external impressions are carried by various pathways to the endings of these tracts in the cortex. Their terminal stations constitute the cortical centres. No especial structure helps to differentiate one area from another; the difference that exists depends solely upon the peripheral connections of the various cortical areas. Meynert was in full possession of a doctrine of the localization of cortical functions long before it was established by Ferrier, Hitzig, and others, and if we add that he pointed out the tracts connecting the various centres and intimated that they were association tracts, in contradistinction to the projection tracts connecting the cortex with lower parts of the brain and with the outer world, we see that the association psychology which is proclaimed at the present time from the very housetops has not led us much beyond the views of the great Austrian anatomist, who once said within my own hearing, and with a conceit that we can pardon in so great a man, that the discoveries of others were the drippings

¹ Psychiatry, Am. Edition, p. 138, et seq.

of his own mind. But were he living to-day he would acknowledge that his doctrines have been advanced a little by the researches of Charcot, Jackson, Flechsig, Wernicke, and some others.

I may presume that every one in this audience is acquainted with the studies which have led to a localization of the various centres in the cortex of man. It is almost superfluous to add that auditory impressions are received in the first and possibly the second temporal convolutions, visual impressions in the occipital lobe, and more particularly on its mesial surface, tactile impressions are received from various parts of the body in the especial areas ultimately governing the motion of these parts, taste and smell impressions are supposed to be received on the inferior surface of the temporal lobe near the hippocampus. The left third frontal convolution harbors the special motor speech centre and there is also a writing centre which by some is located near the centre for the arm. Of other centres we need at present take no account. In the earlier years after the publication of the studies in localization by Ferrier, Munk and their followers, we were in the habit of conceiving of the brain as an organ composed of a large number of special centres, each one of which had some function exclusively in its keeping. Goltz alone stood out prominently in his opposition to the prevalent doctrine of the day, and although he exceeded the mark by denying in toto the doctrine of the minute localization of cortical functions, he did excellent service by insisting that the brain was an organ of especial but harmonious parts and that the simplest function, although it may appear to be the result of the activity of a single small area, was in no sense due to such activity alone and that the entire brain, or a greater part of it at least, had a share in most actions, however simple. There is strong reason to believe that the final truth will be found to lie midway between the positions maintained by Munk and Goltz.

If we consider the development of the infant's brain we shall get the best illustration of the manner in which the cortical functions are developed. The brain of the new-born child, and more particularly its cortex, is a blank structure full of potentialities if you will, but without any distinct impressions save those which have been carried to it from its own body. Kussmaul shrewdly

observed that even the foetus in utero must have become possessed of certain perceptions and of sensations attendant upon definite movements, those of turning and of swallowing for instance. Soon after birth the infant learns to distinguish between its own body and the world beyond it. Contact of a strange finger excites but one tactile sensation; contact between two parts of its own body excites two tactile sensations, one from the touching and the other from the touched part (Wundt, Meynert). A sound striking the infant's ear produces an auditory impression, but as soon as it hears its own cry the auditory perception is attended by the sensation of its own muscular vocal effort. The sensations of its own body are so much more frequent, so much more intense, and so much more constant that they outweigh those received from the outer world and by their repetition and intensity help to establish the conception of its own individuality. It is of less interest to us for our present purposes to show how the conception of the ego is engendered than to illustrate the importance of sensory perceptions.

The sensory stimuli are carried, as was said before, by the various pathways to the terminal areas in the cortex. These areas, or rather the cells contained therein, are in some way so affected by peripheral stimuli that a perception and a memory of the sensations are established in accordance with the varying character of the peripheral irritant. As the majority of things, animate and inanimate, are so constituted as to impress the child's brain by more than one sensory pathway, the various sensations carried inward simultaneously become associated with each other and thus help to form the concept of an object. I need only instance the form, color and odor of a flower; the taste and sight of milk. Frequent repetition of the same impression helps to form the very earliest concepts; so the child soon realizes the meaning and importance of nurse and mother. In every instance the sensory impression is the primary one, but sensations of movements soon become intimately associated with this, as when the child is taught to suck as soon as it receives the tactile impression of the mother's or nurse's nipple. The value and precedence of sensory impressions are particularly evident in the acquisition of language, and pardon me for referring to a well-known subject, but the entire subject of aphasia has a fundamental importance in its relation to normal and morbid mental processes. The child receives aud-

itory impressions for months and months before it acquires the power of articulation; as soon as it has acquired this power it comes into possession of another distinct set of sensory impressions, the sensations of innervation which accompany the act of articulation and which are repeated with every effort. The frequent repetition of these impressions and of special sensation of innervation help not only to form a definite concept, but in the course of time the association between these various sensory memories or images is so firmly established that excitation of any one image may be sufficient to call up the entire concept. The association of concepts in the development of language becomes still more complicated as the visual images of the printed or written word and the memories of those muscular efforts employed in writing a word or in reading aloud are associated with the tactile, olfactory, or visual images of the object denoted by a given sign, the word. Would it not be absurd to claim that speech is the special faculty of any one small area? In pronouncing the simplest word or in reading aloud and understanding a printed sentence almost every part of the hemisphere becomes engaged. However complex the process may become, it still remains a matter of sensory memories or images which have been deposited in the cortical cells of different areas, but these special images would be entirely useless if they had not been permanently and definitely associated with one another. In passing let me expatiate a moment upon the secondary effects of sensory stimulation upon the production of pleasure or pain according to the intensity of irritation. Every such stimulus is attended by pleasurable sensations until it has reached a certain intensity and if carried beyond this point becomes painful. Excessive auditory irritation, loud noises or excessive visual impressions (a very bright light) become painful. The secondary effect upon the cortical areas is also registered, or else we would not be ready to guard against such disagreeable stimulation when repeated.

We have now advanced sufficiently to maintain that the ordinary psychic process is developed in the following order: First, peripheral stimulation; second, perception in one or more sensory areas; third, formation of a concept; and lastly, a motor discharge.¹ The last need not always follow, and the concept may

¹ Cf. Ziehen, *Psychiatrie*, etc., Berlin, 1894.

be made up of many distinct perceptions and of the memories of previous experiences. It is the constant association between the various sensory memories of the past and the present that is by far the most important factor in conscious thought. Upon the one fact of association the psychology of our day chiefly depends, and one of the latest writers on psychiatry (Ziehen) maintains that the association psychology is sufficient to explain all the experiences of clinical psychiatry, and another still more eminent writer expresses the opinion that the disturbance of the association tracts alone suffices to explain abnormal psychic processes. But catch phrases are particularly dangerous. Would this not be equivalent to saying that in a telegraph system the wires are the only important part and that an interruption in the service can never be due to trouble at any station? If there are association fibres, the parts which they help to bring into contact with one another are surely important enough, and the only statement that could be made with a semblance of truth and probability is that, as the association tracts are proportionately greater in extent than the central stations, the former may be more frequently affected than the latter.

Will it be pertinent to inquire whether we are in possession of any anatomical facts which may serve as a foundation for a system of psychology which is based upon definite sensory pathways, distinct cortical areas and well-defined association tracts? The most important contribution to this subject has been made during the last two years by Flechsig;¹ but it is due to the able author and to the important bearing which his facts would have upon the entire development of psychiatry, that his statements should be received willingly but should be analyzed in a fair but critical spirit.

More than twenty years ago Flechsig showed that during the period of development the nerve fibres which have a common function acquire their medullary sheaths at about one and the same time. By the study of the different stages of foetal development definite tracts in the brain and spinal cord were clearly established and have been corroborated by other methods. A

¹ Flechsig's newer theories are to be found in two monographs: *Gehirn u. Seele*, Leipzig, 1896, and *Die Localisation der geistigen Vorgänge*, etc., Leipzig, 1896.

closer study along these same lines has brought to light the interesting fact that the sensory tracts which are first needed in normal mental development are the first to be developed at about the ninth foetal month and that of these the first system contains those fibres which conduct ordinary somatic sensations. Remember if you will Kussmaul's statement regarding the earliest impressions received by the child in utero. These sensory fibres pass into the cord by the posterior roots and reach by diverse paths the posterior third of the internal capsule; thence they pass into the parietal region of the cortex, taking up what were known hitherto as the motor areas of the cortex and some of the tissue beyond. Borrowing a term suggested by Munk, Flechsig calls this area the *Körperfühlsphäre*, which I venture to translate as somatic sensory area. These same investigations will help by-the-by to settle the long mooted question whether or not the motor area is also sensory in character. It is primarily sensory, a justification of the views reached by Bastian and others years ago. A second sensory system is developed about one month after the first system, its fibres passing from the lateral nucleus of the optic thalamus into the same somatic sensory area, into the paracentral lobule, into the first frontal convolution, and some fibres pass into the gyrus fornicatus and the cornu Ammonis—the centres for the senses of taste and smell, functions that are indispensable to the young infant. A third system of fibres exists in the internal capsule and has connections with the lateral nucleus of the optic thalamus; it is developed within the first three months of post-foetal life, and of this system some fibres pass into the third frontal convolution, some into the second frontal, others into the first frontal, and still others into the gyrus fornicatus. If all this be true, there is only one surprising fact, and that is that fibres to the third frontal convolution, the motor speech area, are developed so long before they are put into use; for if there is no accurate correspondence between the time of development of the medullary sheaths of the fibres in a definite cortical region, and the function which that region superintends, the arguments derived from the developmental method lose a very substantial support. By a study of the comparative embryology of the vertebrate series, Edinger has shown that in them the olfactory tract is the first to be developed, but in

them this tract is of far greater importance than in man, in whom the olfactory fibres do not attain to their development until one month after the general somatic sensory fibres have acquired their medullary sheaths. Next in chronological order comes the optic nerve with the optic tract and the radiation of Gratiolet. The auditory tract is the last one of the special sensory pathways to be developed, and its termination in the first temporal convolution is too well known to be insisted upon.

The child does not perform volitional movements until long after birth; we can therefore understand readily enough why the chief motor tracts, the pyramidal, do not obtain full development until several months after birth. The fibres engaged in simple reflex movements in the spinal cord and the medulla are developed at an earlier period. The preceding statements of Flechsig, though in general keeping with the conclusions to be derived from other methods of investigation, should be carefully analyzed. A critical microscopic study of the brain of the foetus and of the young infant is urgently needed and will well repay any one who will make serial sections of the entire central nervous system with reference to the development of the various sensory tracts. However great our confidence may be in any one author, such important investigations need corroboration, and it is a curious fact that the developmental method of Flechsig has been employed by very few workers who have not been in touch with the Leipsic laboratory. Assuming the truth of Flechsig's propositions regarding these sensory areas, we must refer with somewhat bated breath to his more recent theories which refer to the functions of the remaining parts of the cortex. These are essentially "*intellectual centres*." One month after birth, says this author, the intellectual centres are unripe, wholly bare of medullary substance, while the sensory centres, each by itself and independently of the other, have been matured. After the structure of the sensory centres is completed the intellectual centres exhibit the first signs of life and by degrees innumerable medullated fibres grow from the various sensory areas into the intellectual centres, unite with each other, and terminate in the cortex in close juxtaposition to one another. These centres contain a special apparatus associating the various sensory areas, and they ought to be designated as association centres. The full significance of

all this dawns upon us if we add that Flechsig himself insists that disease of the association centres is the chief cause of mental derangement. For the present three distinct association centres are to be established: a frontal or anterior, an insular or median, and a parieto-occipito-temporal or posterior association centre. The character and function of these will vary according to the sensory centres which they connect directly.

These new doctrines are strikingly original unless we may claim that they have been foreshadowed in the description of association bundles which have been recorded by Meynert and Elinger some years ago. Ever since these association tracts were known they were supposed to be the important lines of communication between various centres. The term centre, which had always been used in cortical physiology to designate a terminal station, would seem an unfortunate one in reference to association areas; but Flechsig would have us think of these areas as centres, for in his latest pamphlet he states distinctly that he regards the ganglion cells of these cortical areas as the central organs indispensable, for instance, to the association of concepts. But can we accept all these new theories in blind faith? It is the prominent connection of the parieto-temporo-occipital association centre with the more important psychic processes that startled me. The existence of important projection systems from these areas to the optic thalamus is entirely disregarded. Certain it is that very large tumors in this part of the brain are not attended by any marked mental changes, whereas even relatively small growths in the frontal lobe are often characterized by changes in the individual's character, by hebetude, stupor, and often by a condition of silliness. I have seen several brains of persons who had died long after the period of childhood, which presented large cysts underlying the entire hemisphere caudad of the frontal region; and such patients had not exhibited any marked psychic abnormality. Such cysts, mark you, are best calculated to destroy the association tracts. If these intellectual centres in the parieto-temporo-occipital region have the importance which Flechsig would attach to them, we should be able to find evidence of a special development of this region in man; but such evidence is still totally wanting, whereas it can be definitely maintained that the greater development of the frontal lobes, including the

third frontal convolution, testifies to the fact that in man functions are relegated to this region which are acquired by him and are not possessed by the lower animals. The cortex of the reptile is characterized by the development of olfactory tracts, and its brain has a special facility for the perception and registering of olfactory impressions. The cortex of the bird shows important relations to the sense of sight and less important relations to the sense of smell. In the mammalian series the tactile sphere has been more highly developed, but I cannot find any such marked difference between the brains of the highest monkeys and of man as to warrant one in believing that the latter's great superiority in mental development is to be attributed to the evolution of the parieto-temporo-occipital region. On the other hand, it is well to bear in mind that these differences may not be due to differences in gross structure, but there may be differences as yet undetermined in the cellular structure of this large area of the hemispheres. If this point is to be settled, further microscopical studies on the brains of the monkey and of man are needed. But a still more forcible objection to these more recent views is to be found in the fact that we can hardly suppose that the large frontal area is simply to connect the tactile and other sensory areas with the island of Reil, and possibly the first temporal convolution.

Allowing for the present that the greater part of the hemispheres is composed of sensory centres and of association tracts connecting them, we may stop for an instant to consider the elements which enable the cortex to do the work especially allotted to it. The large cortical cells are unquestionably the sensitive elements to which sensory impressions are carried and in which the special memory or image is stored. The large pyramids are the chief of these cells, but the other smaller cells, particularly those holding an intimate relation to the longitudinal fibres may have other than mere nutritive functions. The cells of one and the same area are brought into relation with one another by the close contact of the dendritic processes and their collateral branches. Meynert proved years ago that the immense number of cells in the cortex of man was sufficient to meet the requirements of the most active mind, so that we need hardly be troubled to decide whether the perception of external impressions and the

registering of the same are to be entrusted to the same or to different cells. According to Kaes, the association fibres increase with the age of the individual, and in all probability *pari passu* with his intellectual needs. The association fibres connect the cells of neighboring convolutions, and the larger association systems establish the connection between different convolutions of each hemisphere, while the commissural tracts bring the various parts of both hemispheres into harmonious action with each other.

Before deciding upon the benefits which psychiatry is to derive from these modern anatomical theories, it will be necessary to refer to another novelty—the conception of the neuron, of which so much has been said of late.¹ The neuron is practically the ganglion cell with all its processes; merely this and nothing more. If it simplify our task at all, it will be by showing that the cell is the all-important element of the cortex; that the causes which affect it affect the fibres emanating from it, and that if there are diseases of association fibres there must of necessity be diseases affecting the association cells. The conception of the neuron has helped to facilitate our understanding of some diseases, in showing that there is no cardinal distinction between gray and white matter, and it has helped to unravel the mystery which formerly surrounded those diseases that involved almost simultaneously the various systems of white fibres and the gray matter. Proportionately with the growth of the neuron concept the value of systemic diseases is lessened. But I cannot go to the extent of believing, as some seem inclined to believe, that every morbid agent must first attack the cell and through it the fibres. If the neuron is to represent the unit of nervous force, any part of it may be subject to disease; but the effect of such will soon be communicated from one part of the neuron to the other. Nor should we lose sight of the fact that, while the cell and cell processes may be primarily affected, they do not after all lead an independent existence either in the cortex or anywhere else; that their vitality depends upon forces beyond them, and, above all, upon the normal condition of the blood and lymph systems. Monti has shown that the dendritic processes have a special rela-

¹ Since this address was delivered an excellent account of the neuron concept has been published by Lewellys F. Barker, New York Med. Journal, May 15, 1897.

tion to blood-vessels, and that if the blood supply is interfered with, these processes are the first to suffer; that the degeneration begins at the point nearest the blood-vessels, the cell body and the neuraxon suffering secondarily. Valuable as this study of cellular changes is, we should not cry "Eureka" as soon as we have demonstrated cell changes or destruction of cell processes in alcoholic insanity, in general paresis, or in senile dementia. We should inquire first whether these changes are not more often secondary than primary, and I believe that there is still much valuable work to be done in studying the neuroglia and in pointing out the important part played by the blood-vessels in various chronic and acute diseases of the brain and mind. Mendel's observations on the changes induced in the blood-vessels and the neighboring tissue by rapid rotation of an animal and the subsequent development of a demented condition, Tuczek's proof of the disappearance of the tangential fibres are still as important as the later observations which have brought to light the changes in general paresis in the cellular structure of the cortex. We must seek a rational explanation for every morbid process affecting the cortex, and should not forget that changes in cellular structure may represent secondary and possibly terminal stages of the disease. Let us not be guilty of the error of the bacteriologist, whose own association centres seem to be completely cut off by the perception of a new visual image in the form of a small microbe. I fear that the conception of the neuron has upset some of our previous association of ideas. Nor is it wise to attempt to explain everything by it. Dercum, whose opinions have always received my most considerate attention, has felt called upon to promulgate the theory of a movable neuron. According to him, everything runs along well enough in our system as long as the various cell processes remain in contact with others, but suddenly they retract, the contact is broken, and now various good and evil things befall the individual. He may become paralyzed, hypnotized, may lose his association of ideas, or may merely fall to sleep. The idea is so simple that we wish it could be proved to be true, but does Dercum know whether such retraction actually occurs in the system of man? I grant that it is not inherently impossible, but can any one determine whether the retraction of a cell process is or is not the active stage as in a

muscular fibre and the lengthening of it a merely passive condition? And if so, paralysis would result on this theory from cellular activity rather than inactivity. But enough of this; let us accept the doctrine of the neuron and let us pursue our studies in normal and morbid histology with judicial calmness. As soon as we shall have gained a sufficient number of facts, self-evident theories of psychic action will present themselves to our minds, but that day has not yet come.

If your patience has not been inordinately taxed, let me put the simple question: How is psychiatry to be benefited by these newly discovered facts and recently promulgated theories? The facts which we have acquired are relatively few. We know that normal mental action is based upon the carrying inward of sensory perceptions; that such perceptions are deposited in different parts of the cortex at the terminal stations of the various pathways by which they have been conveyed. These terminal stations are connected with each other by association tracts. We have shown that no one area of the brain can be said to be independent of the other, and that the simplest concept results from the harmonious action of different parts of the brain. Simple as this process seems to be, and the process is simplified by the introduction of words acting as signs of entire concepts, we soon encounter a perfect labyrinth of sensory impressions and association memories which it is difficult to unravel. The commoner symptoms of mental affections can be explained with considerable ease. Thus, hallucinations must be due to irritation of the various sensory centres, the difference between this and normal excitation being the entire absence of peripheral stimulation. On this hypothesis hallucinations of the various senses must be relegated to affections of the respective sensory areas. The hallucinations of vision occurring in the earlier stages of tumor in the occipital lobe prove that such symptoms can be produced in this way. The organic processes are so rapidly destructive that the effect of irritation is soon lost. Illusions can be explained on the supposition that sensory impressions are received but that the memories of the past are insufficient to account for or properly to interpret such impressions. As soon, however, as we attempt to explain delusions we must face a much more serious problem. The existence of a single delusion denotes that

there is a most marked change in the perfect correlation of concepts which is characteristic of the normal mind. Interference with the proper transmission of association currents, any change in the rapidity of association action, will help to explain the changed mental attitude in acute mania, in melancholy or in general paresis. The sudden irruption of imperative concepts into that well ordered series of associated concepts which go to make up normal consciousness, can be interpreted in harmony with the association theories of mental processes, but it becomes evident that we leave almost unconsciously the domain of solid anatomical fact and enter into the more or less speculative field of morbid psychology. I grant that the transition is unavoidable, is made quite unconsciously; but there is all the more reason why we should not delude ourselves into the belief that we are still proceeding on the safest possible foundation. We must unite psychological, or still better, physiological, with anatomical methods, and much good will come of this union if we avail ourselves of the newer facts developed from time to time. But do not let us venture into deep waters of psychology unless we are in danger of being stranded by hugging too closely the shores of anatomical sciences.

Wernicke has in a very ingenious way built up a theory showing that these false concepts or delusions may be due to a false interpretation of impressions received from the outer world, from the individual's own body, or from his own mental processes. In order to explain these delusions, Wernicke¹ resorts to what he terms the hypothesis of sejunction—a fine word which denotes that there is trouble in the association camp. To my mind it conveys the notion that there is a break in the ordinary association of our ideas, and recalls the spirit of dear old John Locke. Yet sejunction may be a convenient term to use, and it will fit in with my limited vocabulary far better than the auto-psychic, somato-psychic and allo-psychic explanatory delusions will. But I would not in any sense belittle Wernicke's writings, for he seems to me to combine in a peculiarly striking way the faculty of harmonizing anatomical and pathological data with the teachings of physiology and experimental psychology.

¹ Loc. cit., page 112, et seq.

Granted that we are on the verge of discovering the anatomical mechanism by which the simplest mental processes are effected, and granted that we may explain a few morbid symptoms, we are not yet sufficiently advanced to give a rational account of the various changes underlying any mental disease. But it is clearly our duty to persevere in our anatomical and experimental studies in order that we may some day reach a better solution of these many vexed problems. Such studies as those of Berkley in this city, of Van Gieson in New York, are to be welcomed, for they point to the many different causes which may affect the cellular structure of the cortex. It is more than probable that future anatomical studies upon the brains of persons who have been afflicted with mental trouble due to alcohol and other toxic agents will yield results very similar to those obtained by Berkley. Of course the experimental physiologist has the great advantage of being able to direct the morbid process which he has instituted and to examine into the resulting changes at every stage. The pathologist must often be satisfied to see the terminal conditions only.

Within the past few years much has been written upon toxic and auto-toxic insanities. That intoxication plays an important rôle no one can doubt who has observed the relation existing between epilepsy and gastro-intestinal disturbance or witnessed the effects upon the mind of alcoholic poisoning; and the value of auto-intoxication is brought home to any one who has studied the mental peculiarities occurring in patients suffering from myxoedema and who has observed the improvement in all the mental symptoms following upon the administration of thyroid gland. But there is no warrant as yet for the supposition advanced by one able observer—that the factor of heredity in mental disease may largely be due to auto-intoxication during foetal life. I have considered it my duty in various parts of this address to point out the harm done by unwarrantable hypothesis. It is much more difficult to destroy theories after they have once gained a public hearing than to construct them, and instead of advancing our knowledge, they prove to be a distinct obstacle in the path of rational progress.

Those of you who have followed my remarks may have concluded that if my arguments are to hold good the institutions

for the care of the insane should be turned over to the charge of the brain anatomist and the experimental physiologist; but I should regret to leave such an impression, for much as I appreciate the help that is to come to the study of psychiatry from the anatomical, physiological and psychological laboratories, I confidently believe that clinical observation will yield as important results as any one of them. But mental diseases should be studied not only with reference to the needs of society and with reference to the problems of heredity, but the relations of insanity to the entire organism, its relation to other acute and chronic nervous diseases, and, above all, the influence of various poisons, organic and inorganic, upon the cerebral structure, should be most carefully considered. If psychiatry has lain dormant for many years, there is surely no other branch of medical science that at the present time presents as many interesting problems to be solved by him who has eyes to see. The past of psychiatry has been full of discouragement; the present is involved in a maze of uncertainty, but the future is full of hope.

A SKETCH OF PSYCHIATRY IN THE SOUTHERN STATES.¹

"The law of progression is probably a law of nature, of slow development.—(Moses Sheppard, 1857.)

By T. O. POWELL, M. D.,
Medical Superintendent, State Lunatic Asylum, Milledgeville, Ga.

In suggesting a subject for this address, your committee stated that "due credit has never been given to the movement which brought about the erection of the buildings for the insane at the South, and it seems desirable that some special reference be made to the work done by pioneers in that field."

The theme thus briefly indicated is most inviting, and the subject, as must be confessed, has been too long neglected. But not of my own volition, nor without hesitation, would I assume the rôle of historian of the rise and progress of a vast system of charities in the fifteen commonwealths of the South. As this meeting is held in the Southern metropolis, especially renowned for her fostering care of the insane, the occasion seems to demand that the subject proposed by the committee be taken up and dealt with comprehensively, and, so far as possible, according to its high merits. But it is scarcely to be expected that, within the narrow compass of an address such as this, full justice can be done a subject at once so vast in extent, so fertile in material, and so full of tender memories of self-sacrificing men and women long since gone to their reward, leaving us heirs of amplest inheritance.

It is due, however, to the worthy founders of these beneficent institutions that adequate recognition be made even thus tardily, but many of them have left no record other than their good

¹ Presidential Address before the American Medico-Psychological Association at Baltimore, May 11, 1897.

works, thus reminding us that "History makes haste to record great deeds, but often neglects good ones."

While it is thus incumbent upon me to pay due tribute to the illustrious dead, good taste requires that little be said of their living successors, whose own work will in time speak for them. I am none the less aware, however, that men now actively engaged in asylum work at the South have seen far more of improvement than did their worthy predecessors.

In attempting to comply with the request of your committee, I have been sadly conscious of the deficiencies and shortcomings of my essay. And while I have endeavored to pay due tribute to many honored heroes, I have failed to trace even in my own State to the fountain source the earliest hospital movement. Miss Dix, more than any other, was the leading spirit in many Southern States, as she was elsewhere in America and abroad. But before Miss Dix, the good work had begun in Virginia, Maryland, Kentucky, South Carolina and Georgia.

For the *subject-matter* of my address I am indebted to many sources. In some instances I have been fortunate enough to discover living descendants, relatives or friends of the men whose achievements I have attempted to transcribe. They have aided me with brief biographies. While I cannot name here all who have thus placed me under obligation, I may be permitted to single out from their number as especially worthy of our gratitude, Miss Mary Galt of Virginia. Many asylum physicians, both active and retired, have given me freely of their knowledge of their predecessors, but with the prevailing modesty of their class they prefer to be nameless here. Their tributes, however, have shown a sincerity of admiration for the illustrious dead which we, too, must share as we reverently bow with them, feeling that we are standing on sacred ground. Information has been derived from not a few collections of forgotten hospital reports. Singly, it is true, many of them are of small import; probably they were not read by the legislators for whom they were ostensibly prepared, yet, taken together for a series of years, what an epitome of human history they unfold; now of high aspiration and loyalty of purpose, of hope and undaunted courage; now of halting public opinion, of disappointment, of defeat even, but the grand total of it all being a steady progress towards

better things, and all the world brighter because these men have lived.

“The hero is not fed on sweets,
Daily his own heart he eats;
Chambers of the great are jails,
And head-winds right for royal sails.”

It is my desire to pay tribute to the memories of a group of men whose lives were devoted with singleness of purpose to our calling, but whose remoteness from each other, and from the great centres, tended to dim, if not to obscure, their light and their true worth. Many of them were men of recognized character, ability and experience, but they were averse to taking prominent part in either local or national gatherings.

It has been asserted that the South has made history, but her sons have neglected to write it. What is true of the whole, is true also of our part, for our pioneers and veterans, by reason of their exacting administrative duties, failed to a large extent to put in enduring form of monograph or scientific paper the results of their observations. But scattered through neglected reports and medical journals may be found by the diligent inquirer much valuable information and many useful suggestions.

Primus inter pares was Dr. John M. Galt, the younger, of Virginia. He was generally recognized as the most notable writer on neurology and insanity among the earlier generation of Southern alienists. Searching the literature on the treatment of madness, he compiled a work on that subject now almost forgotten. Dr. Galt, Dr. Stribling and Dr. Richard S. Steuart were conspicuous examples of the earlier alienists who lived for the good of the insane and the advancement of psychiatry.

In passing, it is here worthy of mention that the idea of organizing this Association was first conceived at Staunton, Virginia, by Dr. Stribling of Virginia, and Dr. Woodward of Massachusetts. The project of such an organization having met with the hearty approval and co-operation of Drs. Kirkbride and Awl, the famous original thirteen were first convened in Philadelphia, October 16, 1844. The history of the subsequent development of the Association has so recently been reviewed as to be fresh in the minds of you all.

Of a later period, our most distinguished writers were Dr. Peter Bryce of Tuscaloosa, and Dr. John H. Callender of Nashville.

THE INFLUENCE OF MISS DIX.

No record of Southern lunacy administration would be complete without paying homage to the memory of Miss Dorothea L. Dix, the most deserving of sainthood of all the heroes and heroines of this marvelous nineteenth century, for whom we find no human parallel save only John Howard.

Since 1845, when she went on her self-appointed mission as far south as Louisiana, her influence has been felt in every Southern State. In 1849 the site of the hospital at Raleigh, N. C., was named in her honor, and only last year a fund she had long ago collected was instrumental in enabling the South Carolina Hospital to acquire an adjoining estate, a step that in importance is second only to the foundation of the institution.

Upon finding by her own laborious inquiries that an asylum was needed in any community, she marshalled her facts so pathetically and forcibly that they appealed to the most indifferent. In presenting to State Legislatures her various memorials, she sought out the men of greatest ability and influence to champion the cause she had made her own. Having once won the leaders, as well by her womanly kindness and sympathy as by her arguments, she left the cause in their hands. Though sometimes at first unsuccessful, she was indefatigable in fulfilling her holy mission, and in the end always won.

To her personal influence is due the establishment or development of insane hospitals in ten Southern States—Maryland, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Tennessee, Kentucky and Missouri, as well as in the District of Columbia at Washington.

A few very brief instances will illustrate the high degree of appreciation in which she was held. Upon the passage of the bill reorganizing the Maryland Hospital, Dr. Steuart of Baltimore, wrote her: "Most cordially do I congratulate you on *your* success, because I am well convinced that no other means than yours could have produced this result."

The beautiful site of the Government Hospital for the Insane

was finally obtained through her earnest persuasion from its owners, who reluctantly yielded up their home rather than let selfish motives prevent her work for the unfortunates.

In 1859 Miss Dix received a most cordial welcome in Texas, as is instanced by an inn-keeper who said, in refusing remuneration: "Make sure there's a home for you in every house in Texas."

Thus the latter-day saint journeyed through our Southland starting the work here, stimulating it there, aiding by criticism, encouragement and advice where each was needed. The result of such victories of peace as she achieved shall throughout all time be felt in the remotest hamlets of our section. We know that she lies buried in the beautiful cemetery at Mount Auburn, near Boston, but if we seek her monument, then must we visit the noble edifices for the insane in every State.

Before entering, however, upon a history of individual institutions, it may be proper to take a survey of the whole field. It is well to recall that at the close of the last century there were but five public asylums in England, and one public and three corporate asylums in the United States.

As will appear, the first asylum exclusively for the insane in the United States was established at Williamsburg, Va., in 1769, and with that single exception there was no provision made for the insane, especially in the South, for many years. In making this statement I am not unmindful of the existence of a separate ward for the insane in the Pennsylvania Hospital at Philadelphia, dating from 1751. There has been brought to my attention by my friend, Dr. Babcock of South Carolina, some facts connected with an effort made to provide for the insane in that State which indicate the establishment in Charleston in 1762 of a madhouse, as it was called, but of this institution we have no satisfactory history, and must of course assign to the Virginia Hospital the position which I have already given it.

In 1797, the year of the incorporation of Baltimore Town as a city, some of its influential citizens, led by Mr. Jeremiah Yellot, established a hospital for the relief of indigent sick persons and for the reception and care of the insane. This was first called "The Public Hospital," then "The Maryland Hospital," and in 1838 became, by resolution of the General Assembly, "The Maryland Hospital for the Insane."

In passing, it may be well to remember that no community, American or foreign, can point with absolute pride to its history in the care of the defective classes. The proudest and wealthiest States have reason to bow with shame for errors and failures of duty to the insane. With all the glorious progress of the century just closing, no State can yet feel justified in claiming to have fully discharged its obligations to its dependents and defectives.

The history of the care of the insane in our section of the country shows a gradual process of evolution which may be studied advantageously, since it explains many questions and problems that separately are not easy to be comprehended.

For convenience, an attempt will be made to divide the subject into periods, although, of course, no separate line of demarcation can be drawn as applicable to the whole section. For while one State has made rapid advances, its neighbor may have remained stationary through the indifference or inertia of its people.

FIRST PERIOD.—In colonial days the methods were necessarily primitive. Ideas of demoniacal possession held sway. The treatment was little less than barbarous. The insane were chained in strongly-constructed houses. Paupers were supported by assessment upon the parish in which they lived. In some colonies the laws recognized and made provision for lunatic slaves. The prevailing conception was to protect the sane, and the insane were therefore neglected.

SECOND PERIOD.—About the time of the Revolutionary War, evidence of a better spirit appeared, in that the insane were placed in almshouses, thus passing further under the jurisdiction of the commissioners of the poor. Laymen had official charge of both paupers and lunatics.

In the larger communities, especially in cities, the insane were sometimes assigned to wards and outbuildings of general hospitals. The common designation of these receptacles was "mad-houses," and their inmates were held in great contempt. During this period probably little was done in the way of medical treatment, and the lunatics were under charge of brutal keepers.

In some of the States in the early part of the century the insane were also boarded out in private families at a nominal rate determined by the judges of the lower courts and paid by the commissioners of the poor.

THIRD PERIOD.—In the third decade of the century lunatic asylums were founded in Kentucky and South Carolina, and a second institution in Virginia and the Maryland Hospital reorganized. The purpose was partly humane and partly economic. The usefulness of the asylum at Williamsburg had long been demonstrated and its fame spread abroad. The writings and teachings of Dr. Benjamin Rush were also a factor. One or more physicians were naturally found among the leading spirits for establishing asylums. These institutions were built in large towns, and were massive structures. They admitted not only lunatics, but idiots and epileptics. Only the most violent were committed. The asylums were under charge of lay superintendents; in some instances of not a high order of intelligence. Physicians paid visits as the superintendents thought it necessary. The prevailing ideas were altogether custodial. Restraint was common, and violent methods of repression were in vogue, such as shower-baths, tranquillizing chairs, bleeding and vomiting.

The first asylums were planned on a very small scale, and the provisions made for their support exceedingly meagre. The rigid adherence of the Southern legislatures to the doctrine that the State should do for the individual nothing which he could do for himself led the legislatures to aim at making asylums self-supporting; that is, the States erected the buildings but the county commissioners of the poor were expected to pay for the support of their paupers.

Payment was required of all who were able to pay. The result of this effort was very unsatisfactory, but it was not abandoned for many years. The official positions were not sought for.

FOURTH PERIOD.—During the decade following 1830, both Tennessee and Georgia established asylums. About 1840 lay superintendents began to give place to "resident physicians" or "medical superintendents," although in some places visiting physicians were continued. Restraint was modified. County care still prevailed, and the profits from pay patients were applied to reducing the expenses of the paupers. Curative treatment began, although the custodial idea was not abandoned. The number of patients even in populous States was small because the prejudice to asylums still prevailed, and county officers en-

couraged the admission of the violent only. The resident physician was often purchasing and disbursing agent as well as medical adviser. In this period asylums were established in Louisiana and North Carolina.

FIFTH PERIOD.—The decade following 1850 was one of great activity in asylum construction at the South. At the beginning of this period American asylums were said to lead the world. State hospitals were established in Missouri, Mississippi, Texas and Alabama and a second asylum in Kentucky. Dr. Kirkbride's influence was manifest in the plans of construction, and Drs. Galt and Stribling of Virginia, were the recognized leaders in treatment, management and discipline. County care was still continued. The number of patients was so small that no superintendent required more than one assistant physician. A few insane negroes were under care in Maryland, Virginia, South Carolina and Louisiana. The only Southern States not provided with asylums in 1860 were Florida and Arkansas.

SOUTHERN HOSPITALS DURING THE LATE WAR AND RECONSTRUCTION PERIOD.

The ordeal that asylums passed through during the late war and the period of reconstruction can be realized but faintly now. The demand for soldiers called every able-bodied man to the front, which made serviceable male attendants hard to secure. Clothing was scarce, and worse than all, the food supply was so reduced that often real want stared the hospitals in the face; but through the wondrous providence of God, and the untiring efforts of the self-sacrificing officers, the patients were fed, clothed and sheltered. Upon the close of the war the overthrow of State governments added to the disorder. Another danger menaced the asylums in some of the Southern States in that political interference appeared and proved hurtful to the institutions. It is but due, however, to some State governments during the reconstruction days, to say that they had hearts to sympathize with this afflicted class, and recognized the fact that politics should not interfere with the administration of hospitals for the insane. But the times were hard, State credit was low and everything was uncertain. The administrative officers lived anxious and labori-

ous days; but they stood bravely to their posts and did what they could for the care and welfare of their respective charges, and at last came safely out of the storm. We cannot overestimate the credit due those noble, humane men for their inflexible fidelity to their trust during the time of this turmoil. I have no knowledge of any insane hospital, save one, being closed either during the war or the reconstruction period.

THE COLORED INSANE.

In one particular alone does lunacy administration at the South differ from the same problem elsewhere in our country. What the race problem is to our whole section, so is the question of the colored insane to our specialty. Provision for this class has always been a separate and peculiar problem. Before the war there were, comparatively speaking, few negro lunatics. Following their sudden emancipation their number of insane began to multiply, and, as accumulating statistics show, the number is now alarmingly large and on the increase. This is not the place to enter into an inquiry as to the etiology, but only to recognize the fact and show how earnestly State administrations are striving to meet it.

We have been confronted with the question of providing for a class emerging from servitude, of different race, habits, instincts and training. The alien pauper insane of the great centres of population, North and West, may in a measure represent our negro lunatics, the burden of whose support has fallen upon their former owners, themselves struggling to rise from the impoverishment of war.

Those authorities who have given not only most thought to the subject, but who have also dealt with it practically in our asylums, have been unanimous in the opinion that the separation of white and colored patients is to the advantage of both races. The distinction has been made for social reasons alone. Consequently, we find to-day in most Southern asylums four departments, whereas in other institutions two suffice. Virginia and North Carolina have entirely separate hospitals in the centre of the negro population near the Atlantic seaboard. This policy has not been deemed advisable in other States, partly for econom-

ical reasons but largely because the negro population is more uniformly distributed.

Even the existence of insanity in negro slaves has been questioned. But insanity was common enough to require special provision for the care of lunatic slaves by the Provincial Council of South Carolina in 1745, and the pressing need of means for their accommodation is shown by the early records of our asylums as they were successfully established before 1860.

Prior to the Civil War, in the asylums of Virginia, Kentucky, South Carolina, Maryland, Louisiana and the District of Columbia, colored lunatics were received as patients. In those days the accommodations for negroes were probably not adequate, but a generation ago our predecessors began the work, which we of a later day have in some States not yet been able to carry to the consummation so devoutly to be wished for. Among the pioneers in caring for negro lunatics may be mentioned Stribling and Galt of Virginia, Chipley of Kentucky, Trezevant and Parker of South Carolina, Steuart of Maryland, and Nichols of the District of Columbia.

Following their emancipation the negroes have become subject to the same penalties that other races have paid for liberty, license and intemperance. Among those penalties insanity is not the least. A recent estimate, based upon the records at the census office, shows that brain disease in the negro as compared with the whites has increased from one-fifth as common in 1850 and 1860 to one-third as common in 1870 and one-half as common in 1880 and 1890. Or, stated in another way, the ratio of insanity per million among the negroes has risen from 169 in 1860 to 886 in 1890.

Until a recent period, the Southern negro was in a great measure exempt from both insanity and tuberculosis. To-day, associated with insanity, we find tuberculosis alarmingly prevalent among our colored patients, especially in the females. As a race, their mortality is greater than the whites. Medication is of little effect. The tendency of the disease is towards a rapid and fatal decline. If we cannot cure, possibly we may prevent. To this end isolation of tuberculous cases is the most rational method at our command.

ASSOCIATION OF SOUTHERN HOSPITALS.

The superintendents of a number of Southern hospitals of contiguous States in sympathy with each other, because they were subject to the same dangers, responsibilities and duties, have often considered the feasibility of an organization representing and favoring the interests peculiar to the institutions in their section. As a result of suggestions and opinions expressed at various times, an informal meeting of the Southern members of the Medico-Psychological Association was held in Chicago in 1893. A committee was appointed to consider the advisability of forming an Association of Southern Hospitals for the Insane, and to report at the next meeting of the National Association. The following year, in Philadelphia, a plan of organization was proposed and a constitution submitted. These were approved and an association formed. The Association has now held two meetings, one at Atlanta, Ga., in 1895, and one at Asheville, N. C., in 1896, and seems to be entering upon a useful career.

The principal aim and object of this Association is to enable us to meet the class of troubles peculiar to Southern institutions and to give our specialty in this section an awakening and progressive tendency, which is so much needed, and to which a combination of efforts must contribute to the cause of psychiatry, and benefit in many ways our own institutions, and in many particulars that are peculiar to them, such as arise, for instance, from climatic conditions, decided difference in population, and from limited financial support, and especially from political interference.

It is also believed that many advantages will be obtained by the hospitals associated together that could not be gained from the larger National Association, and the success of one would contribute to the other.

ADVANCES.

I am glad to say from a general survey of the work in the Southern States, that in no section of the country is there a more intelligent and earnest effort made for the insane than there is now made in the South.

All honor to the memory of those who were prominent in the

early care and treatment of the Southern insane! The moral grandeur and blessed results of their work can never be estimated. We have taken up their unfinished work and made radical changes and improvements, which have been continuous and progressive, and which have added greatly to the comfort and welfare of the insane.

In my judgment, one of the most rational and humane changes made in the care and treatment of the insane is the abandonment of mechanical and chemical restraint as a general thing. Improved accommodations can be seen in every section of the South. Among other advances may be mentioned the extension of greater liberty to the patients; hospital buildings or wards where the feeble and sick have special care and attention; associated dormitories; better night supervision; training schools which supply the hospitals with educated nurses, colonies, congregate dining rooms, amusement halls, chapels, libraries, reading and working rooms for convalescents, detached buildings on the cottage plan with homelike surroundings, and every possible means to divert and lead the mind into normal channels; careful and systematic employment, indoors and out, shop and field.

There have been in the past two decades many advances in the clinical, pathological and therapeutic methods as well as in construction and administration.

It was not until about 1890 that the Southern hospitals may be said to have really recovered from the vicissitudes following the periods of war and reconstruction. The question of bare maintenance and provision for a rapidly increasing population had been paramount. The buildings erected in the last generation have been absolutely free from architectural effect. There has been such need of economy that even to-day many asylums have not a sufficient nursing staff. For a generation it was indeed a struggle for existence.

The study of my subject has taught me that the best and most far-sighted alienists have not proven themselves good prophets when they have undertaken to dogmatize or prophesy about the increase of insanity or about the future policy of States in the management of the insane.

The dogmas of 1850 have ceased to appear annually as appendices to our asylum reports. We have learned that while an

asylum of less than 250 patients may still constitute an ideal institution, yet the policy of a State may demand the maintenance of a colony of ten times 250.

I trust, however, that you will pardon me if I attempt to draw some conclusions from my study of the evolution of Southern asylums.

It appears to me that about 1890 our institutions entered upon an era which may be termed the beginning of the scientific period. In the State hospitals generally infirmary wards were introduced and training schools for nurses were established. These adjuncts are the first essentials of hospital life. Several of our institutions have well equipped, well managed pathological laboratories under skilled neuro-pathologists. From these we expect scientific progress.

The separation of acute and chronic insane into different institutions has not so far been adopted into the policy of any Southern State. The further segregation of the colored insane will, in time, no doubt become a more important problem. Meanwhile, most Southern States have yet to solve the question of establishing schools for the feeble-minded, asylums for insane criminals, colonies for epileptics and hospitals for inebriates. Although all these questions have been discussed in many States, they have not yet secured following sufficient to obtain legislative aid for their consummation. And yet, before our asylums can be regarded as firmly established on a scientific basis, all these classes must be separated from the insane proper.

Until recently, perhaps too much attention has been paid by neuro-pathologists to the study of nerve tissues to the exclusion of those of the glandular structures of the body.

While such work has been of great value, we are beginning now better to understand that insanity is largely only a symptom, and that many forms of mental derangement present no pathological changes capable so far of demonstration. The intoxication of the cellular nerve elements by auto-infection has of late received much close study and is still being investigated by many of our best workers, as is evidenced by the programme of this meeting.

The kidneys of the insane seem to be affected to a much greater degree than are those of persons dying sane. The re-

sults obtained in laboratory investigation upon this subject by Dr. Bondurant of the Alabama-Bryce Hospital, Dr. Blackburn of the Government Hospital, Dr. Richardson of Mount Hope, and Dr. Oertel of the Georgia Lunatic Asylum, as well as others, demonstrate the vast importance of careful urinalysis in all cases of mental and nervous disease, and inspire the hope that where timely diagnosis of renal disease is established the patient may be cured of this condition and at the same time of his mental trouble.

The advances of the past few decades have been such that we are warranted in sustaining the hope that it is within our power to penetrate the mysteries which still enshroud so many vital questions and come at last to a perfect understanding of this wonderful, complex nervous system and its subtle life force.

The blood is now receiving the close attention of hundreds of eager trained observers. We have learned the roll of the leucocyte, which for a long time escaped notice altogether, and now differentiate at least five varieties of this cell, some writers describing still other forms.

Whatever of good emanates from the laboratory must always depend largely upon clinical research and data. The one is a check upon the other.

It is to be hoped that the day is not far distant when every hospital for the insane in this broad land shall boast its laboratory where may be carried out the clinical and post-mortem studies which are of so much interest and value to us all.

POLITICS AND ASYLUMS.

I have given the best history or sketch obtainable with the data at my command of the early care and treatment of the Southern insane and those that were prominent in their care, and referred in a general way to some of the advances that have been made without going into details. The thing that is most to be deplored and apprehended is the growing tendency to subject the care of this afflicted class to political spoilsmen, a flagrant injustice both to the insane and to faithful and efficient officers. It is a violation of all the dictates of humanity, a blot and reflection upon our Christian intelligence, that such a sacred, humane and divine trust should be carried into politics for selfish considerations.

The histories I have presented bring clearly also to view the fact that those institutions sustain the most useful relationship to the public in which the officers have remained longest in service.

As early as 1848 this Association placed itself on record as deprecating the application of the spoils system to insane hospitals. Since then our readers and speakers have frequently discussed and deplored any relationship between politics and asylums.

In this sketch I have shown how in the early days positions in asylums were little sought after. With the growth of the institutions and increase of emoluments the positions formerly condemned began to attract the attention of the working politicians. From this cause have risen the chief evils of our hospital system.

If we are entering upon a really scientific period, then these hospitals must be freed from such corrupt and unscientific methods. We must no longer content ourselves with "deploring" the fact; we must combat the evil for the cause of science which is the cause of humanity. The public must be taught that these hospitals cannot become the centres of scientific research, and thus truly progressive and curative as is their purpose, unless their physicians are encouraged and assured of permanent tenure of office.

Our best medical schools declare four years short enough for a man to acquire sufficient knowledge and skill to practice medicine and surgery. The general public have been quick to appreciate the benefits of a more rigorous curriculum. We may rely upon the broad common sense of our respective communities to sustain all efforts that point to a like improvement in the administration and service of our insane hospitals. Superintendents are made, not born. It requires years of conscientious and faithful effort to acquire experience sufficient to deal scientifically with the manifold problems of asylum life. A recent change in the political complexion of one of our States threatened to remove a well recognized authority in our specialty. While the matter was under discussion, it was well said that if the new governor should be fortunate enough to select the best general practitioner in the State for the position, it would take that physician just 15 years to stand where his predecessor had stood. With such demoralizing methods can we expect progress? In none of

our Southern States has the question yet reached the stage of statutory importance, although our best governors and lawmakers are familiar with the evils of political interference in our institutions.

To further the end we have all so devoutly wished, I would recommend the enactment by each State of such a statute as that recently adopted by Indiana. If this generation makes such provision statutory, the next will make it constitutional.

The Indiana law reads:

"Boards of trustees shall in the employment of superintendents, and confirmation of assistants and other employés, take into consideration only the qualification and fitness of the persons selected to fill such places, and no person shall be selected or employed to fill any of such positions on account of his political belief or affiliations, and no superintendent, assistant or employé shall be dismissed from service on account of his political belief, faith or affiliations, and in the employment or dismissal of such superintendent, assistant or employé, the qualifications, character, merit and fitness shall be the only matter to be considered by such Board of Trustees in the selection or retention of such employé."

In conclusion allow me to thank you for the distinguished honor you have conferred upon me.

GENERAL QUESTIONS OF AUTO-INFECTION.

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Physiological chemistry and bacteriology have been making rapid strides of late years, and laboratory research has opened up new fields for clinical investigation. That auto-infection and intoxication play important parts in the development of certain forms of nervous disease, has long been suspected, but it is only now that we are beginning to realize the true importance of the subject, and while it is true that there is a tendency on the part of some investigators, to put almost every nervous disease in the autotoxic category, time will enable us to strike the proper balance and clearly distinguish between cause and effect. How far we are justified in classifying many nervous diseases as of autotoxic origin, yet remains to be seen, and for a time speculation must be rife, at least until the physiological chemist and the clinical investigator can so thoroughly compare notes, that proper conclusions can be drawn. Up to the present time the theorist has had the field pretty well to himself; it is now time for the clinician to assert himself and prove how far the theorist is right, for after all it is the practical side that most concerns us.

Of recent literature, the contribution of Dr. Ira Van Gieson on the Toxic Basis of Neural Disease, published in the New York State's Hospital Bulletin in October, 1896, is of the deepest interest to alienists, as it approaches the subject in a moderate spirit, and the author is not blind to the fact that we must not jump at conclusions too hastily. Dr. Van Gieson has covered the theoretical ground so thoroughly and fully, and with such fairness, that we cannot help feeling deeply indebted to him for making clear many problems necessarily of great complexity to the student of disease. Those of us who have been for years dealing with the insane, cannot fail to have been impressed time

and again with the fact that certain forms of insanity are clearly autotoxic. Take, for example, some of the remarkable cases of insanity occurring in connection with nephritis, where the condition at once suggests the delirium of intoxication. In cases such as these it is a simple matter to arrive at the conclusion, that nerve cells are suffering from a pathological process not limited to the neural tissues alone; in other words, we will freely admit that toxins are the origin of cell degeneration. In all of the cases of insanity following suppression or disturbance of the functions of an organ, due either to disease or removal, where the condition is well known and easily understood, we have no difficulty in accepting autotoxis as a probable cause, and the successful treatment of myxoedomic insanity by the administration of thyroid, is the proof likely to be accepted by the clinician.

It appears to me that there is often a tendency to confound cause with effect in speaking of the influence of toxins in disease, and in some instances at least, to magnify the part played by autotoxis. Some lose sight of the fact that autotoxis is merely a secondary condition, and the primary defect is overlooked in the anxiety to counteract the influence of toxins. The therapeutic measures adopted simply temporize, and do not aim at curing the original lesion. This is a danger not to be forgotten, and while it may be admitted that some varieties of insanity are purely of autotoxic origin, it is more than probable that in the majority of cases, even granting the presence of toxins, it will be found that they are only one of the factors to be considered. So far is this theory of the origin of cell degeneration carried out that, in order to free it from danger of assault, even the influence of heredity has been denied. As a matter of fact, this is not necessary; there is nothing in the theory to conflict with the well-established facts in connection with hereditary tendency to some forms of disease. Now, while it is true that there is a debatable ground where many a hard battle may be fought, in regard to the origin of some forms of insanity, others are clearly autotoxic.

Long ago I was impressed by this fact, and having ventured this opinion in 1893 in regard to a class of cases called "anomalous," anticipated methods of treatment since adopted with success, although without the ability or knowledge to give an explanation, as to why an acute disease should prove curative in forms of insanity ordinarily regarded as incurable.

We had passed through several outbreaks of typhoid fever, and after the development of the disease, many cases of mental recovery had taken place when least expected; in other instances marked temporary improvement with sudden relapse had occurred. In the majority of instances the stuporous condition of the patients, benefited by typhoid, and the general evidence of impaired function in different organs, suggested autotoxis. That recovery after the development of typhoid should occur, seemed surprising, although there was evidence that a changed metabolism had much to do with the matter. Afterwards the successful treatment of these cases by thyroid, was the natural outcome of the experience gone through. Many of these patients were undoubtedly suffering from auto-intoxications from the gastrointestinal tract; in fact, it is in this group we must look for many cases of insanity. How could a changed metabolism produce such beneficial effect? We long ago learned that in many cases of insanity, a changed metabolism is the one thing required to induce a cure. The stimulus of an accident, a blow on the head, the effort to elope, or some trivial occurrence may be the starting point, and if autotoxis is the condition present, the very lucid explanation of parenchymatous degeneration and repair of neural tissue given by Van Gieson, makes the reason for the gradual improvement apparent.

Taking it for granted, that these cases were of autotoxic type,—and there is evidence beyond mere guess work to show that they were, evidence such as excessive amounts of indican in the urine,—there was a lesson to be drawn in the way of suggesting a more rational therapeusis than that of mere intestinal antisepsis, useful as that is. We should, I think, endeavor to take broader ground than that of mere local treatment, and endeavor to establish what Van Gieson styles cytothesis, by means which prevent the production of the toxines, rather than to rest satisfied with neutralizing them when in existence. It may be urged that when toxines are neutralized, nerve cells will undergo the cytothetic change, but if the original conditions exist there is reason to believe that the repair may prove but temporary. I have seen this happen, and the danger exists when improvement dependent on a changed metabolism occurs, where cytolysis has nearly approached cytoclasis. Where thyroid has been administered this

has proved to be the case, and where cell degeneration has passed a certain stage the improvement effected has been temporary and cytothesis impossible. McLane Hamilton, basing his opinion on the works of Bouchard, Rodriguez, Chardon, Lavaure, Macpherson, Eccles, St. John Bullen, and Turner, believes that many of the acute insanities are due to primal intestinal disorders, and that the course of the chronic psychoses must be more or less modified by the same agencies, and he has carried on some interesting experiments to prove his theories, but the cases are too few to enable us to formulate any definite hypothesis. Still, the results obtained are of decided interest and suggestive of lines of investigation to be followed.

We should be careful, I think, in studying this subject of auto-toxis to avoid rushing to extremes, and without free inquiry should be slow to classify nearly all nervous diseases as of auto-toxic origin. More benefit will result by a careful and systematic study of those which can, without doubt, be assigned to the auto-toxic class, and it is in this particular the practical clinician can be of the greatest use to the physiologist. The complexity of the subject is great, and I think we cannot be too careful in avoiding the acceptance of any theory likely to narrow us in our observations.

In experimental cachexia strumipriva we have a condition universally admitted as autotoxic. It is interesting to read what well-known authorities say in regard to this:

Wesley Mills, in writing of several cases of experimental cachexia strumipriva says: "The tendency now seems to be to abandon the earlier theory, that the cachexia was produced by failure to abstract some injurious product from the blood, when the gland is diseased or has been removed by operation. Attention is now rather called to the probability that those products, which the gland supplies, are essential to its complete constitution, and without which defect in the metabolism must result.

"It is being slowly realized that the corpuscles do not constitute the blood, and that the blood is not, as by far the larger proportion of students are apt to think, a mass of cells floating in a fluid which exists principally to convey these corpuscles hither and thither, but rather that the blood is a fluid of infinite complexity, and of whose composition, except as regards a few of the coarser details, we know but little, except in the vaguest way."

Again he says, "I am unable to comprehend how we can understand the effects of removal of an organ, by simply bearing in mind the part it plays of itself, so to speak, without also remembering what influence it may have as a part of a complex whole.

"In a complicated mechanism some wheel may of itself have little use, but by its removal the general balance is destroyed; so in the animal body, by the removal of one part, countless of the other parts are thrown out of adjustment. Hence, to say that the thyroid gland when extinguished fails to remove from, or to impart to the blood certain compounds may be true, doubtless is true, though we may be, and probably are, inadequately informed as to what is taken from and added to the blood; but it is only a small part of the truth, for how can we possibly estimate how far-reaching such disturbance may be, apart altogether from the direct effect of the gland itself in the way usually indicated."

Van Gieson says: "Nevertheless, while at present no definite and precise statement of the relation of the whole class of auto-toxic poisons to the production of neural disease, can be given, there are few examples of auto-intoxication in which there is an unequivocal demonstration of the involvement of the nervous system by an auto-poison. In experimental thyropravia in dogs, the universal acute degeneration of the destructive type, which involves the whole cortex of the brain, corresponds very well with the fatal manifestations of irritation and destruction of portions of the nervous system.

"These changes in the ganglion cell have no other explanation than in the action of an auto-poison circulating within the body, which comes in contact with the ganglion cell. In certain cases of uraemia, I have been able to demonstrate acute degeneration of the cortical cells, but of a much less extensive and severe type than in thyropravia."

It is evident, then, that we cannot be too careful in assuming that the whole case has been proved in every variety of mental disease, and we must avoid getting narrowed in our research. Possibly one of the most satisfactory methods of investigation for the practical student, who has to deal with the actual cases of insanity rather than with the theoretical cases, is by analogy, and if he makes haste slowly, in the end he will not have lost any-

thing. To my mind it is quite evident that certain classes of mental trouble are clearly autotoxic in their origin, that is, if we reason by analogy.

To the alienist there is ordinarily little difficulty in distinguishing between the delirium present in one suffering from alcoholic poisoning, and the excitement and incoherence of the generality of cases of mania, and yet there are cases where mania partakes more of the character of delirium than anything else; where the hallucinations at night are remarkable, and where the conditions of muscular excitement are so analogous to those seen in alcoholism, that the suspicion of toxaemia is at once created. I have seen this after operations where the ovaries were removed, in nephritis, in exophthalmic goitre, and, of course, in the cases of acute delirious insanity, the condition of the urine, when examined, confirming the belief. In many instances, too, there were remarkable periods of comparative freedom from excitement, followed by attacks of the wildest delirium.

In one case of acute melancholia of the extreme resistive type, and in these there is a strong possibility of toxaemia, almost complete mental balance could be restored for a day or more by the administration of moderate doses of calomel.

In another class of cases, probably autotoxic, a class benefited by anything which will change the metabolism, there is a marked element of stupor analogous to that produced by some well-known poisons. In these all of the bodily functions are plainly deranged, and if great care is not taken, cytoclasis will eventually occur, although in nearly every instance there is an effort made to establish cytothesis, an effort that can undoubtedly be aided by the clearer light we are getting on autotoxis.

Some of these patients have melancholia with stupor, others sub-acute mania with the stuporous element prominent, but invariably a certain amount of stupor is present, and this condition in a case of insanity of recent origin is plainly suggestive of toxaemia.

As might be expected, epilepsy is classed as one of the toxic diseases, not without a good deal of reason if the analogy argument is to hold good, for the convulsive seizures in uraemia are undoubtedly the outcome of toxaemia. However, the epileptic question will be fully referred to, I believe, by another member

of this Association, and as it is the most difficult of all to understand and explain, I leave it willingly. In a general way the fact that definite poisons, not of autotoxic origin, can produce insanity, should make it easy to understand the autotoxic basis of insanity, and the researches of Bouchard have made very clear how many toxic substances are produced, particularly in the gastro-intestinal tract, when the function of some of the organs is disturbed. However, we must never lose sight of the fact, that if the function of the organ were not impaired, the poison would not exist, and it strikes me this is the very point the theorist is extremely apt to overlook. When the auto-intoxication is due to a kidney lesion we are not slow to recognize the fact, and at once direct our attention to the care of that organ, and if autotoxis does play as large a part in the production of mental disease as many assert, we must certainly look beyond the mere fact of the existence of toxines; we must direct our investigations to the origin of toxines as well as to neutralizing their effect when present.

We must remember that even the brain cells themselves may be the origin of toxines, and we must not forget in our haste to adopt an attractive and seductive theory of the origin of disease, that toxæmia, as at present understood, will not account for everything we call insanity, although it will account for much.

Such investigators as Van Gieson will do much to unravel the tangle, but we have a part to play also, and by intelligent clinical investigation must strive to make clear the exact part autotoxis plays in each case of insanity.

Some authors seem to think that in auto-intoxication, we will find a rational explanation of the remittent character of some of the well defined psychoses, and place them in the gastro-intestinal group, and certainly the theory is a fascinating one in the alternating insanities, although in folie circulaire the process of reasoning is more difficult to understand. In general paresis, if the syphilitic origin of the majority of cases be admitted, the question may become simple when the pathogenic toxic substances, including autotoxic substances, bacteriological poisons, extrinsic poisons, and protozoal poisons are more fully understood, but we must be patient until the physiological chemist has made much more complete investigation than has yet been done,

and must even reason by analogy in numbers of instances, a process of reasoning unsatisfactory in a sense, but not by any means to be despised in practical medicine.

We may take it for granted that the autotoxic basis of nervous disease is proved in many instances; that it is at least an important factor in other forms of insanity, and although we are not in a position to positively affirm the part it plays, it certainly will explain the existence of forms of insanity difficult to understand in the past.

What are the practical questions we must face if the foregoing be true?

We must help the physiological chemist and the pathologist to unravel the complicated problems as rapidly as possible, by practical investigation of the toxicity of the blood and excreta of insane persons, so that we may place our therapeutics on a rational basis. In the alternating, subacute, and circular psychoses, there is a particularly promising field for research, but, above all, we must study the whole question from the broadest standpoint possible, and endeavor by intelligent investigation to assist in the development, of what promises to be one of the greatest additions of the century to our knowledge of the cause of certain forms of insanity.

CLINICAL ASPECTS OF AUTO-INTOXICATION.¹

By ARTHUR W. HURD, M. D.,

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The demonstration of the existence of auto-infection as a causative factor in mental disease does not lie within the province of this section of the series of the papers on the subject, but involves rather a brief consideration of the clinical aspects of such cases as have by recent and remote observers been considered as examples of such infection, together with a review of the methods best adapted to combating the conditions.

It is not hoped that methods entirely new or universally successful can be demonstrated, but rather by a collection of the means most successful in different hands, such a working system can be outlined as may suggest at some points and in certain directions, methods of relief in this class of patients.

The most enthusiastic can hardly claim the universal activity of this cause predominantly in all cases, though at some period in each life history of an attack, it may have been prominent in causing relapses or an exacerbation of disturbance.

It is not in old chronic patients with fixed delusions and with an apparently healthy digestive apparatus that acute intestinal intoxication is to be expected, but rather in acute cases with changing delusions, muttering incoherence, restlessness, constipation, elevated temperature, offensive breath, and dry, hot or clammy skin. It is conceded by many and an increasing number of students, that intestinal putrefaction is evidenced by the presence of indican in the feces or by the conjugate sulphates and indican in the urine. In suspected cases the examination of the dejecta should be made in the laboratory as corroborative proof, though their absence would hardly justify the observer in with-

¹ Read before the American Medico-Psychological Association, May 12, 1897.

holding the measures necessary for relieving the condition referred to. And this condition, it is well to remember, may come on at any time in an attack of insanity, in patients apparently in fair health and enjoying fairly accurate functioning, on the part of the stomach and intestines, liver and kidneys. That the rapid development of systemic poisoning by failure of elimination by one organ, the kidneys, can come on like a thunder-clap in a clear sky, has been demonstrated most painfully within the past week in the case of a matron of the Nurses' Home of one of our State hospitals, who, in apparent good health, was seized with convulsions with rapidly oncoming coma at breakfast time, and at 10 P. M. the same day was dead, with 50 per cent of albumin in the urine and a great quantity of casts. And this without sufficient ill-health previously to interfere with duties or to attract sufficient attention to lead her to consult a physician.

The examination of the feces for indol can be made by Simon's method, to whose excellent treatise I am indebted very largely for the following paragraphs on the chemical examination of the dejecta.

Tyrosin produced during the process of albuminous putrefaction, and also during tryptic digestion, must be regarded as the mother substance of phenol, cresol, indol and skatol. As tyrosin, however, is very readily decomposed, it is usually not found in the feces, but the products of its decomposition instead, viz., the phenols, indol and skatol. In the urine these bodies, after having undergone oxidation, unite with sulphuric acid, or if this be not present in sufficient amount, with glycuronic acid and are excreted as phenol, indoxyl and skatoxyl sulphates or glycuronates in the urine. In the feces, on the other hand, phenol, cresol, indol and skatol are found as such.

The feces are diluted with water acidified with phosphoric acid and distilled. The volatile fatty acids present, together with phenol, indol and skatol pass over. The distillate is then neutralized with sodium carbonate and again distilled. During this process the three substances pass over, leaving the fatty acids behind as sodium salts. This mixture of the three, when treated with KOH and distilled, allows indol and skatol alone to pass over, and they can be separated by their different degree of solu-

bility in water. Indol forms small plates melting at 52° C., easily soluble in hot water, alcohol and ether. Skatol crystallizes also in plates melting at 95° C. and is less soluble.

Indol thus obtained when treated with nitric acid and a little sodium nitrate shows a crystalline red precipitate of the nitrate of nitroso-indol. Or a small piece of pine wood, if moistened with an alcoholic solution of the indol, when acidified with muriatic acid, will be colored a cherry red.

To determine indican in the urine, a specimen is taken from the collection for twenty-four hours. A few cubic centimeters are mixed with an equal amount of concentrated hydrochloric acid and two or three drops of a strong solution of sodium or calcium hypochloride or common saltpetre and $\frac{1}{2}$ cc. of chloroform are added. The mixture is thoroughly agitated and set aside. The indigo set free in this manner is taken up by the chloroform, producing a blue color, the degree of increase as compared with the normal being determined by the intensity of color. Bile pigment or potassium iodide must be eliminated from the urine or neutralized before the test is made.

The sulphates in the urine also form a basis for conclusion, and a brief reference to the valuable work of Simon in this connection is useful.

While the greater portion of the sulphuric acid excreted in the urine is found in this form of mineral sulphates, about one-tenth of the total amount may be shown to be in combination with aromatic substances of the oxygen group, the most important of these being the salts of phenol, indoxyl and skatoxyl. Indoxyl and skatoxyl are derived from indol and skatol, which, with phenol, are found during the process of intestinal putrefaction, their amount increasing and decreasing with the amount of putrefaction and serving as a direct index of its intensity.

The mineral sulphates have been termed preformed sulphates in contradistinction to the other, which are known as conjugate or ethereal sulphates.

The amount of sulphates eliminated during the twenty-four hours by a normal person varies between two and three grains, the ratio of preformed to conjugate sulphates being 10:1.

The conjugate sulphates are increased in all cases of intestinal putrefaction. Simon's observations have led to the following conclusions:

1. A diminution in the secretion of hydrochloric acid (gastric) is accompanied by an increased degree of intestinal putrefaction.
2. An increase in the secretion of HCl is accompanied by a decrease in the degree of intestinal putrefaction.
3. The degree of intestinal putrefaction may be measured directly by the elimination of the conjugate sulphates.

Thus an increase in the conjugate sulphates points in a general way to an increased intestinal putrefaction due to a total anachlorhydric or at least a hypochlorhydric of the gastric juice associated with bacterial fermentation, if lactic or butyric acid are not present in large amounts; biliary and intestinal obstruction may produce the same result, but these usually have other symptoms which may demonstrate their presence.

To test for the preformed sulphates, a few cubic centimeters of urine strongly acidified with acetic acid are treated with a few drops of a solution of BaCl_2 , when in their presence a cloudy or white precipitate referable to the formation of BaSO_4 will form.

To test for the conjugate sulphates, 25 cc. of urine are treated with the same volume of an alkaline barium chloride mixture (2 vol. of sol. barium hydrate and one of BaCl saturated at ordinary temperatures) and filtered after a few minutes, the preformed sulphates as well as the phosphates being thus removed. The filtrate is strongly acidified with HCl and boiled with the occurrence of a precipitate will be referable to conjugate sulphates.

The clinical picture of cases evidently suffering from intestinal toxæmia readily presents itself to all hospital men whose service includes the reception of many acute cases. One of the types of these may be considered the puerperal state, and the following paragraph from Dr. McLane Hamilton in regard to alcoholic insanity applies equally well to many other acute insanities:

"If we stop a moment to consider the clinical features of acute alcoholic insanity we shall find many of the symptoms of a rapidly developing toxæmia, quite apart from that effect upon the nervous system which may be produced by the agent itself.

"Cerebral hyperæsthesia, rapid changes in perverted perception, the development of the peculiar hallucinations in which rotten substances, worms, bad odors or other horrors appear, often figure; the hyperkinesis, cephalalgia, malaise, etc., and the antecedent history of gastric intestinal disorders, the presence of

abundant aromatic sulphates, urea and indican in the urine, and possibly skatol, the foul, small stools or diarrhoea, the final unstable and changing delusions, exhaustion and death are suggestive. When we consider that the proteids have passed undigested through the small intestines and have accumulated below, where they lie enfolded in a congested and feeble gut, it is not difficult to appreciate the fact that they form a rich field for bacterial attack with the resultant introduction into the system of an amount of toxic material sufficient to produce a most serious change in the functions of the brain and cord.

"The alcoholic extracts of fecal matter, according to Bouchard, are far more toxic than ordinary putrid matter, so it will be appreciated how readily skatol, indol and other alkaloids of the feces may be introduced in such quantities as to do much mischief. The successful treatment of the cases of alcoholic insanity that have come under my notice certainly goes far to strengthen this view."

The practical treatment of these cases includes, first of course, ridding the lower bowel of putrefying matters, and for this purpose high enemata are the most useful. The experiments of Bowman, which show that when a fistula was made above the colon, indol and skatol and the other conjugate sulphates disappear, to recur again when the intestinal contents were allowed to pass through the lower bowel, proved that the putrefactive process goes on mostly in the lower bowel.

The fact that these changes go on most actively when there is a lack of or a greatly diminished amount of hydrochloric acid secreted by the stomach, presents an important therapeutic suggestion; and hydrochloric acid should be administered in such cases.

First and foremost, the intestinal contents, which have become a source of infection, must be cleared out. Washing out the lower bowel with a saline solution is usually necessary. To reach the contents of the small intestines, however, cathartics and laxatives are essential, and a subsequent flushing by laxative mineral waters is of great utility.

To empty the smaller intestines, castor oil and the salines, many of the laxative mineral waters, and small doses of calomel are all useful.

Much has been said and written on the subject of intestinal antiseptics, and while experimentally many appear to be useful, their use must be secondary to the evacuation of the offending intestinal contents. When we consider the relative disproportion between the intestinal contents and the amount of drug which can be given, unless in very abundant solution, it is a little difficult to see how effect can be produced by actual contact. At the same time as adjuvants to washing out the bowels, flushings with mineral waters and appropriate diet, they are useful, and a brief review of some of the drugs which have been considered antiseptic may be of advantage.

It has been objected that in order to give thorough antiseptics, it is necessary to give drugs in such quantity and of such character as to produce serious injury, if not actual local lesions in the stomach or intestines, or else grave systemic poisoning or both. Practically, however, it seems possible to administer doses sufficient to retard bacterial development, falling short of absolute destruction of micro-organisms, and thus to assist in producing a return of healthy intestinal function.

Of the antiseptics a great many have been tried, and in the administration there are certain considerations which must be taken into account, however, before we should in any unfavorable case infer that the theory is faulty. For instance, certain germs are found principally in the large intestine and in children's diarrhoeal diseases, the point of greatest bacterial development being in the ileum and in the large intestine. Consequently, freely soluble drugs are not likely to affect more than the stomach and upper part of the small intestines, and the least soluble the colon.

Disappointment as to the effect of antiseptics may be due in many instances to the fact that in reality the seat of the trouble has not been reached. On the other hand, the least soluble antiseptics, like naphthalin and bismuth, have an excellent effect on cases in which the decomposition appears low down. Bismuth, a time-honored remedy in the treatment of intestinal troubles, has had its good results attributed to its astringent properties, but it seems now as if it were its antiseptic qualities which have all along been efficient. And this leads to the observation, and it is a striking fact, that those drugs which for years before the days of antiseptics held the strongest place as controllers of diarrhoea,

are now proved to be drugs which are antiseptic, such as bismuth, calomel, the mineral acids, the chlorides and sulphates of iron and the nitrate of silver, given, it is again to be noted, not for their antiseptic properties, for that was unknown, but for their astringent action. Creosote was one of the earliest, if not the earliest, drug given in diarrhoeal diseases, and was used in 1846 by Mayes, and, following him, many other experimenters have recorded the favorable results they have obtained, but after some years' use it appears to have been neglected.

Oil of naphtha was also used early, and many favorable results were chronicled. Salicin also received considerable attention, and early in the seventies a number of articles in its favor appeared, especially in southern medical journals. It is possible that in some of the southern localities it was found especially useful in cases in which a malarial element existed. Later, salicylic acid and salicylate of calcium and of bismuth were used by some physicians, among whom was Hutchinson of Brooklyn, who reported twenty-seven cases of serous diarrhoea in young children in whom immediate improvement in all the symptoms followed exhibition of this drug combined with ether.

Baginsky's article on antiseptics in intestinal disease a few years ago directed much attention to the subject and was the first to arouse a permanent interest in this mode of treatment, former articles and experiments having been somewhat sporadic in their appearance and local in the interest excited.

It is likely also that of late years progress in bacteriology has served to direct attention more closely to intestinal antiseptics, demonstrating the rationality of treatment which heretofore in the imperfect state of our knowledge of the relation of micro-organisms to disease had been largely empirical. Resorcin and naphthalin were advocated by Baginsky, while others soon brought forward benzoate of sodium, bisulphide of carbon and chloride of potassium.

Dr. L. Emmett Holt some years ago made a series of elaborate investigations of the diarrhoeal diseases of children, of supposed bacterial origin, the results of which he gave to the New York Academy of Medicine. Suffice it to say that the percentage of recoveries under the use of diet and supposed intestinal antiseptics was very much larger than under the old method of opium

and astringents. It is but fair to say, however, that this author, while admitting the usefulness in many cases of intestinal antiseptics, in his last work on diseases of children lays more stress in this form of trouble on the use of cathartics, washing out the lower bowel and diet, than on drugs.

Of all of these, one of the most practical, however, and one which has been found exceedingly useful by Dr. Hamilton, as stated in his recent articles on the subject, is salicylate of sodium in ten to fifteen grain doses thrice daily.

The ingestion of considerable quantities of water, either alone or medicated, is in itself an excellent means of elimination, not only for the intestines, but for the kidneys and skin as well. We have introduced in our institution a charging apparatus by which mineral waters can be made, carbonated and rendered very palatable, this palatability allowing greater quantities to be taken. Carbonated waters, through the fact of their aeration, are also credited with being a direct stimulant to the gastro-intestinal membrane. The apparatus consists of a few simple elements easily managed by a pharmacist. As yet we have manufactured only a limited number of artificial waters. We use principally the plain carbonated water and Vichy water made up with Hanbury Smith's salts, containing bicarbonates of sodium, potassium, magnesium, strontia and calcium, and sulphate, phosphate, arseniate and chloride of sodium; also, in addition to the above, lithiated Vichy, containing carbonate of lithia. It is easy to secure packages of these salts, and the following waters, if desired, can be made: Kissingen, Chalybeate, Congress, Curt, Deep Rock, Eger, Excelsior, Geyser, High Rock, Lithiated Vichy, Pullna, Pyrmont, Saratoga Vichy, Selters, Spa, Star, Vichy, Bitter Kissingen and Marienbad. The average cost of these is about fifty to sixty cents per ten gallons.

Among these waters selection may be made for their laxative, alterative, cathartic, chalybeate, tonic and anti-rheumatic effects as desired. The plain carbonated water is apparently a stimulant to the intestinal tract, and is a convenient vehicle in which to give milk. In cases of acute mania, acute melancholia, presenting symptoms of intestinal toxæmia, we find the waters especially useful.

In all such patients diaphoresis is stimulated by warm baths

and massage, and in some instances, especially in cases of thin, feeble patients, subsequent inunctions of cocoa butter have proved nutritive. Finally, in addition to the elimination of offending intestinal contents and nullifying putrefactive changes by the exhibition of antiseptics, the use of mineral baths, mineral waters, etc., we should remember that the toxic substances absorbed are in themselves destructive of red globules. This after effect must be combated by the use of blood-forming agents like certain combination of iron, or, what is perhaps better than any, a glyceride of bone marrow.

While these measures are applicable only to a small proportion of the permanent inhabitants of our asylums and hospitals, they are applicable to a much larger proportion of *acute* admissions, and the range of applicability will, I am sure, be much widened in the experience of each observer who carefully studies his new cases with the subject of toxic conditions in view.

DISCUSSION.

DR. VAN GIESON.—The first speaker does well to caution us not to go too far in applying the auto-toxic theory to all forms of mental and nervous disease. Apparently, in the evolution of our knowledge of any form of disease, there must come a period of speculation which frequently does not a little harm, and it is perhaps only fair to say that we are in such a period of speculation now in endeavoring to build up the auto-toxic theory of nervous and mental diseases. After all, this theory is not entirely new, but is simply an extension of the old humoral theory of disease which, in its relation to the induction of mental disease, was expressed so well a hundred years ago by Benjamin Rush, who declared in substance that madness arose because the brain shared with other organs in the body the damage inflicted by gout, dropsy, rheumatism, eclampsia of pregnancy, the fevers and the like.

Excluding cases of insanity of psychic origin, we must conclude that a good share of mental disorders are to be ascribed to a toxic agency, particularly those belonging to the most subtle class of poisons, the autogenous category.

Any thorough comprehension of the toxic basis of mental and nervous disease beyond speculative hypothesis, has been rendered possible only within very recent times.

The precise knowledge of the structure of the nervous system attained by the application of the Golgi methods, the clear insight into the action of bacterial poisons upon the tissues given by experimental pathology, and, above all, the progress of modern cytology and the application of its methods in pathological research, have at last removed the barriers to comprehensive investigation of mental and nervous diseases.

The first speaker has been cautious also to remind us of the rôle of inheritance in the induction of neural disease. Yet I venture to believe that some of the burdens of inheritance on the body at large or on the nervous system receive a reasonable explanation in that they may be the transmitted effects of toxic agents damaging the neural and somatic cells in the ancestors. At any rate, if we think of "neuropathic dispositions" and inherited vulnerability of the nervous system as the latent effects of toxic agencies in the progenitors, it confers less of a vague character to the meaning of these things. The effect of alcoholism in subsequent generations is very likely a concrete example of the latent effects of transmitted toxic damage to the neural cells.

Much time has been wasted and much confusion has arisen in the investigation of neural disease by studying the nervous system as something apart from the rest of the body, and often enough it has been made to appear that the nervous system had a radically peculiar structure of its own, and a *sui generis* set of pathological changes different or distinct from lesions elsewhere in the body.

No observer in this attitude, or lacking opportunities to study the beginning of neural lesions, or the comprehensive scope of the general pathologist, can have any philosophical conception of the nature of nervous disease.

The whole body in all of its parts is composed of cells or their derivatives, and the brain forms no exception to the general fundamental plan of cellular integrations witnessed in all other parts of the body. The nervous system is built upon the same fundamental plan as other humbler and more simple tissues and organs of the body, and, furthermore, it behaves just like these other

tissues and organs in its reaction to pathogenic agencies. The nervous system has no distinct pathological processes of its own without analogy elsewhere in the body.

If we would comprehend the nature of the neural lesions which lie parallel to the manifestations of mental and nervous disease, we must study the simpler organs and tissues of the body and the pathological processes that occur in them; then the observer may appropriately seek to investigate the nervous system, for we shall surely find that the pathological processes in the brain in all of its complex and bewildering morbid manifestations are in no wise fundamentally different than those elsewhere in the body.

It is well, too, to remember that while the clinical varieties of neural disease are many and its symptomatology protean, the pathological processes underlying these diseases or phases of diseases are but few in number. All of the vast and varied manifestations of organic neural disease are due to degeneration, inflammation or necrosis with their combinations and various phases of development.

Perhaps the most fundamental point in gaining a clear conception of how the brain shares with other organs of the body the effects of toxic agents in the acute general diseases is to look upon it as being built like other organs and to co-relate it with these other organs. If we do this, we shall find that it is built in a general way very much like the kidney. Thus, like the kidney, the brain has a stroma and a parenchyma. The stroma corresponds to the neuroglia, and the parenchyma to the neurons. The stroma in the brain behaves like the stroma in the kidney when subject to disease, and the neural parenchyma also behaves like that of the kidney, liver or other viscera of the body when exposed to toxic agencies. Thus we have in the brain an exact analogue of the lesion which was formerly termed by the pathologist cloudy swelling of the kidney.

We know that acute parenchymatous degeneration of the kidney is quite regularly caused by the action of toxic substances of a most diversified character and I have found that the analogue of this lesion of the kidney occurs in the nervous system, especially the cerebellum and brain cortex very frequently indeed, and that its occurrence is due to the same reason as in the kidneys or other viscera, namely, to the action of poisons, whether they be of the extrinsic, bacterial or autogenous class.

Acute parenchymatous degeneration of the brain is of enormous importance in explaining many of the expressions of acute nervous and mental diseases, and equally important is the understanding of the chronic form of parenchymatous degeneration of the nervous system in explaining the subacute, persistent and chronic varieties of the neural diseases.

The capacity of recovery of the nervous system from acute parenchymatous degeneration is of the utmost importance to the clinician. This depends chiefly upon the duration factor in the exhibition of the poison which causes the neural parenchymatous degeneration. If the poison act but a short time upon the neurons their recovery from the degenerative process is possible. If the poison be persistent, however, the cells are liable to become permanently damaged.

Time permits of only the briefest reference to parenchymatous degeneration of the nervous system, but its very great importance, particularly the acute variety, deserves much emphasis in the clear understanding of the involvement of the brain in the acute general toxic diseases. Acute parenchymatous degeneration of the nervous system, whether of little or great intensity, is very liable to occur in all of the acute general toxic diseases such as typhoid fever, pneumonia, influenza, uremia, sunstroke, and the like. The delirium accompanying these acute toxic diseases is due to acute parenchymatous degeneration of the cortex.

The first speaker, Dr. Clarke, has done me the honor of adopting some terms that I have thought were practical and useful. I should like to show on the blackboard what they mean. (Illustrating on the board.)

Let us take a nerve cell of the motor type which is easy to understand. We find it crowded with distinct granules which have an important signification because they are the working units of the cell. They are the storehouses of energy of the cell, and if poisons come into contact with such a ganglion cell we find first a dissolution of the edges of the granules, and that finally the granules disappear or break up into fine dust. Attending the action of such poisons on the cell, we have an expression of the liberation of its energy, manifested often by delirium, yet up to this point in the toxic degenerative process the ganglion cell is capable of recovery. We know this because if the poison is taken

away and the patient is properly treated the lost function returns. We may, therefore, use the term *cytolysis* to indicate cell resolution up to, but not beyond the point of beginning destruction, and to express the opposite process of recovery of the cell from its partial degeneration by the term *cytothesis*. Finally, if these poisons persist, the process of dissolution of the working units of the ganglion cells passes over into destructive processes in the cell. There is loss of the cellular substance, changes in the vital centre of the cell,—the nucleus,—and the ganglion cell is doomed. For this condition the term cytolysis or cell destruction is to be used.

The second speaker, Dr. Hill, has shown us that notwithstanding the subtle agency of poisons in the production of mental diseases, the time seems to be approaching when they will not be entirely beyond medical interference. A most interesting point brought out in the second paper is the percentage of cases in which he found dilatation of the stomach. This lesion has been found to be most distinctly associated with tetany and tends to show to some extent that there is a relation between the two diseases (epilepsy and tetany), not only clinically, but etiologically.

The third speaker, Dr. A. W. Hurd, has penetrated a realm that few have dared to approach, and has done it in such a way as to show that the ground can be approached from a practical standpoint and that we may hope to analyze the autogenous poisons arising from or associated with the gastro-intestinal tract.

THE PSYCHO-MOTOR PROBLEM.¹

By HERBERT NICHOLS.

In this paper it is proposed to study the relation of mental processes to muscular activity. As an example in our problem, when I extend my arm we wish to know the mental states that correspond to the cortical discharge causing that movement.

Preliminarily, we may note the different kinds of movement commonly discussed in text-books, and the opinions held of them. A generation or two ago, much was said of "automatic" movement. It was believed that certain ganglia act spontaneously from within themselves and without stimulation. The brain hemispheres were conceived to act conspicuously in this way, and thus to display what was looked upon as the neural side of Free Will. All volitions were classed in this "automatic" category. To-day, opinion regarding such movements is at least much modified, and leading biologists declare that protoplasm, from first to last, is never active save in response to some outer physical stimulation. That this last is true to the extent that some incoming impetus is necessary to start the response is now nearly certain. But in the case of rhythms called out by a single exciting impulse, it is difficult to deny all spontaneity of movement. For example, when the sound of a single clock-tick calls up in one's mind a series of memory-ticks, we can scarcely credit each term of this series to different cells, that is, to a series of cells. Yet if we credit this string of repetitions, from one stimulation, to successive activities of the same cells, we seem obliged to attribute to these cells some sort of "automatic" habit. This much, however, may now be accepted as established—that no part of our organism ever acts save upon receipt of *some* excitation, and that the form of its response is always a habit based in inherited phylo-

¹ This lecture was one of a course of six upon "Modern Psychology and its Bearings," delivered by the author at Johns Hopkins University in March, 1896.

genetic development and modified in most cases by life's experiences.

The antithesis of automatic movement is named, in modern and as well in older text-books, "reflex action." The term originated with Descartes in the year 1646. Descartes conceived that certain of the nervous "spirits," which ran through the "hollow tubes or nerves" to a central point in the brain, did not find entrance to the soul and to consciousness, but were "reflected" back through other "tubes or nerves" in a way giving rise to unconscious and purely mechanical movements. His follower, Astruc, went so far as to explain that the angles of incidence and reflection of the nervous spirits at the brain centre were equal, precisely as when light is reflected from a mirror. From Descartes down close to modern times, the terms "reflex," "mechanical" and "unconscious" were used synonymously in opposition to "conscious" and "volitional." To-day, "reflex" has lost most of its former significance and is used conventionally to cover all conversion of afferent into efferent impulses, with a tendency to prefer the term for relatively direct and simple responses. In this sense it is applied as well to conscious as to unconscious activities. Thus we speak of the unconscious patellar reflex, which may be called out in sleep, and of conscious brain reflexes, such as snatching the hand from a prick or burn.

Next to reflex movements, we may place those commonly called "instinctive." Descartes sweepingly declared all instincts to be unconscious, mechanical activities; even going so far as to assert that all animals below man are absolutely unconscious. Thus at first "reflex" and "instinctive" were synonymous. Now, however, technical usage has wrought a conventional difference between them on the score of complexity, and, on the same score, even to make a difference between "instinctive movements" and "instinctive conduct." The three terms now indicate different degrees of complexity of movement. The simplest are styled "reflex." Those a degree higher—such, perhaps, as a cat would make, if thrown in the air, in order to light on its feet, or such as a swallow would make in its first flight—such as these are called "instinctive movements." And all very complex conduct that is due to inherited tendency is spoken of as "instinctive conduct," the habits of most animals being popularly supposed to belong to this class.

When we ask if instinctive movements and conduct are now conceived to be conscious or unconscious, we raise the curtain in a striking manner upon the transitional state of modern psychology. Even popular opinion has pretty well outgrown the notion that any sharp line exists between man and other animals. Every analogy suggests that our congenitally inherited conscious tendencies form the elementary groundwork from which all subsequently developing psychic life, both intellectual and aesthetic, fundamentally takes formulation and government; that the adult mind develops from these as faithfully as does the adult body from the physical embryo. Yet there is not a textbook extant that gives more than a glimmering recognition to such a possibility, and not one that, in the few perfunctory words commonly devoted to Instincts in systematic works, does not treat of them in a place and manner so detached from its fundamental exposition of Will, Feeling and Intellect, as to obscure their psychic and biologic importance. Such leaders as Wundt, Bain, Volkmann, Höffding, Titchener, Romanes, Morgan, Schneider and Preyer now positively endow instincts with more or less sensory and affective accompaniment. But even these beginnings of consideration are confessedly inadequate, and, for the most part, other psychologic writers still betray undisturbed impress of the tradition that instincts are wholly unconscious processes.

Rising above "reflexes," "instinctive movements" and "instinctive conduct" we come to those processes more commonly classed under Volition and Will. And to appreciate current discussions of these we must glance at some of the historic conceptions of Will.

Before the days of modern science Will was looked upon as a separate and irreducible "Faculty" of Mind, or of the entity or "Soul," supposed to lie behind the mind. Later, and with the decay of "faculty" doctrines which began through the influence of Descartes, Will came to be regarded as a special function of mental states themselves. As such it was declared to be a function of *all* mental states. Yet this last happened because it enabled the total doctrine of mind, under which this will function was thus coördinated, to be theoretically rounded out to a beautiful "tri-partite" perfection; this, rather than that the detailed rela-

tion of mental states to muscular activity had been brought to any well comprehended focus. This vague theoretical doctrine held the field down to the date of modern experimentation. Early in the days when mental states began to be correlated definitely with brain states, certain pretty accurately defined neural elements came to be regarded as the basis of the Will. This happened largely through certain bundles of fibres being discovered—those of the Rolandic region—through which those motor impulses leave the cortex which innervate the muscles of the legs, of the arms and of the trunk. These areas were at first declared to be peculiarly motor and not sensory at all. There can be little doubt that scientists were misled to this conception through prevailing superstition as to the enormous gap between sensory and motor processes. In time, however, it came to be understood that these areas represented as well the sensory functions aroused by currents coming to them from the movements of the limbs and muscles, as the motor impulses going out from these areas to innervate the muscles.

As a consequence of thus grounding both the incoming and the outgoing currents upon the same neural elements, the sense-quality corresponding to these elements rose to high significance in the problem of the Will. Since from the one side their activities were looked upon as the special seat of motor innervation, so from the other their specific mental counterparts came to be regarded as the essential basis of "motor ideas." Hence arose the muscle-sense theory of will.

In its first and radical form this theory declared muscle-sense to be the sole direct basis of muscular innervation and the essential element of all volition. It was, however, soon demonstrated by normal experiments and by pathological and theoretical considerations, that the skin sensations and those coming from the joints also play an unmistakable part in the control of the limbs. Consequently, the doctrine was widened to include them. But it remained the essence of the muscle-sense theory that these combined sensations are indispensable to *every* volition.

Even as thus widened, this theory again proved to be inadequate. To understand, either systematically or historically, its final fate, we must consider Prof. Wundt's "Innervation Sense" and Prof. James' "Kinaesthetic Theory."

It is impossible to do justice in few words to Prof. Wundt's conception, since it involves an exceedingly complicated basal notion, upon which his whole system of psychology is built. Suffice it to say for present purposes, that he declares the mind to be possessed of a special kind of sense which is always proportional to the amount of effort exerted in each given movement. He does not deny that we receive muscle, skin and joint sensations from such movements, nor that they play much the same rôle in the formation of "motor ideas" that advocates of muscle-sense ascribe to them. But he asserts that the activities of certain parts of the cortex (which he calls the "apperception centres," and inclines to "localize" in the frontal lobes) control the motor areas as to when and what degree they shall act. These control activities he conceives to be sensory, and to thus furnish an additional element to our motor ideas proportionally to the amount of activity exercised in every volitional effort. Prof. Wundt conceives that this apperception function controls not alone all muscular activities, but Attention and all thought processes as well. And he thus comes to identify it in its full range of exercise with the will.

Prof. Wundt's theory has been widely criticised, and, as I am inclined to believe, as widely underrated and misunderstood. The precise point concerning which most critics have been led astray I will speak of presently. But in general, and before taking up the arguments which have been launched against any such sort of special sense, it may be observed that attention, whatever it involves, unquestionably plays an important rôle as well in motor as in intellectual processes; that it is unmistakably a cortical phenomenon, and that being cortical, it is nearly certain to be sensory.

Of course it is possible, under our present ignorance of it, to conceive attention to be explained in different ways. Thus it may prove to be an instinctive habit, collectively, of our ordinary five senses and entire brain. Or, again, of such parts of them as are active together at each passing moment. Or, finally, and in accord with Prof. Wundt's view, it may be the function of some special portion of the brain not included in the apparatus of our ordinary five senses. Any one of these possible conceptions serves tolerably well for explaining the ordinary phenomena of

motor innervation when these are considered alone. But when we take a wider view of the facts of attention, both from the mental and the motor side, our choice is not so free. It can scarcely be denied that attention is fundamentally involved with "interest," and that "interest" is primarily instinctive. And there are many considerations arising as well from morphology and comparative zoölogy as from psychology, which make it extremely doubtful if we can base instincts in general, and, above all, our deeper, primary ones, upon the same anatomical parts *alone* that underlie our five senses. To follow the line of thought here suggested would take us too far from our present purposes. Nor do we need to follow it, since certain other facts, soon to be reached, will sufficiently justify the assertion that Prof. Wundt is probably right in the general notion that attention is a sensory process in some degree additional to the activities of our five sense elements pure and simple, and one that continually participates in motor innervation and furnishes mental content to our motor ideas.

It is easy, however, to overrate the rôle that this control process plays in our Motor Problem. And this brings us to consider Prof. James' Kinaesthetic Theory and the criticism which it involves against Innervation Sense. Upon the publication of Prof. Wundt's theory, objections were raised against it on the ground that we certainly do control our movements by other means than this alleged Sense of Innervation. The case of Dr. Strümpell's anaesthetic boy brings the points of contention clearly to view. This boy had so lost his normal sources of sensation that absolutely the only ones remaining to him were the right eye and the left ear. With these he could write and coördinate his movements effectively. But when his eyes and ears were bandaged he was not only unable to coördinate his movements, but could not tell at all where his limbs were when their position was changed by an attendant. This showed conclusively that certain guiding sensations were necessary to their coördination, and it seemed to show that sight alone was sufficient for this coördination. In short, the facts of this very instructive and important case seemed to Prof. James to contradict both the Muscle Sense Theory which confined our "motor ideas" to skin, joint and muscle sensations, and Prof. Wundt's

Innervation Theory, which ascribes the control of movements to some sort of special apperceptive sense.

Of course we may suspect that memory-traces of other functions than sight had been stored up before the boy lost all feeling from his body, and that afterwards active sight stimulation should efficiently arouse these to their customary motor innervations. Yet if such traces were so preserved, it is difficult to conceive why the boy should have been unable to use them in coördinating movements, through memory, when his eyes were shut. And inasmuch as he could not do this, the value of the sight elements received while looking at our limbs and body in motion were exalted in significance.

The theory consequently suggested to Prof. James was, that all sensations whatsoever, muscle, skin, joint, sight, sound, taste and smell, which result *from* any bodily movement, unite to form our idea of that movement, and that this idea, through revival, becomes the customary motor idea for executing that movement. Or, put more cogently, the brain elements stimulated by return currents from any movement are the elements commonly active in making that movement. This, briefly stated, is Prof. James' Kinaesthetic, or Feelings-from-movement Theory of Motor Ideas.

That the Kinaesthetic Theory supplants the Muscle-sense Theory is now commonly conceded. Yet the condition in which it is left by Prof. James soon betrays itself to be unsatisfactory. It seems quite impossible, upon any grounds *à priori* or experimental, to draw a sharp line through any given class of sensations, for example, that of sight, and to believe that one-half of them may become direct innervators of motion, and the remainder of them may not. In the case of the skilled pianist reading from the music score, must we say that associational development has turned the sight elements, originally concerned in guiding the fingers, into direct motor-elements, and yet cannot join the similar visual elements concerned in reading the notes into equally direct motor connection? If it can, and if the sight of music may, then, become immediately motor, it is difficult to understand why any and every sensory brain element *may not*, by proper association, become so equally well.

That it may become so is the belief which our latest science

is rapidly confirming, and is the one I shall hope to leave with you at the end of this paper. Meanwhile, to continue our purpose of reaching our final formula historically, we must now glance again to see how it survives the shock of Prof. James' criticism. Prof. James seemed to find in the case of the Strümpell boy an argument as follows: "The boy could control his limbs when his eye was open. It is difficult to believe that the mere closing of his eye robbed him of his innervation sense, if such there be. And since shutting his eye did rob him of all control of his limbs, therefore an innervation sense seems improbable." But in this argument everything hangs upon the significance given to the word "control." It seems probable that if, in place of sight, either joint sensation or muscle sensation had been the only sense left to the boy, he would still have been unable to coördinate his limbs and would have been able alone to throw them about . without at all knowing their position, all as in his actual condition. And in this case Prof. James could have argued as sharply against joint or muscle sense, provided their existence had not been established in other ways, as he did against Prof. Wundt's Innervation Sense. In other words, his argument is not conclusive at all, though it brings out the important difference in function between these simpler sensations (or their corresponding impulses) which serve for throwing the limbs about incoördinately, and those fuller mental pictures which give us our intelligent perception of the contour of our limbs and of surrounding objects and serve in guiding our coördinations. That these fuller pictures are afforded us chiefly by touch and sight, and that one or the other of these is indispensable to the proper use of our limbs, no one is now likely to deny.

It turns out, however, that this sort of coördination was not what Prof. Wundt had in mind when he spoke of the apperception centres *controlling* our movements. For his later expositions claim for them only *general* government over all movements, to say when and to what degree the effort to make them shall be put forth. This sort of government the Strümpell boy possessed even when his eyes were closed. And if innervation sense hereafter is to mean only a blind sense of effort, and of the degree to which such effort is willed, at once we see that this famous dispute has chiefly been carried on at cross-purposes, and that the

determination of innervation sense, or no innervation sense, is a problem that need not confound our present one of discovering the mental states that more particularly direct our movements.

I have now reviewed the chief theories devised in explanation of voluntary, muscular innervation; and the result may be summarized as follows:

1st. Whether or not there is any such innervation sense as Prof. Wundt conceives, would seem to depend on undetermined facts, and to hang on whether or not attention shall prove to be a habit-function of the cortex as a whole, or to be based, with other of the deeper instincts, upon some portion or portions of the brain other than those occupied by our ordinary five-sense elements.

2d. Neither the skin, the joint, nor the muscle sensation, nor any single kind of sense alone, are necessary to the exercise of bodily movements; but either sight or touch is necessary to the intelligent coördination of most movements.

3d. Kinaesthetic sensations, or those which result from bodily movements, *commonly* unite to form our ideas of those movements. And these ideas, by intimate association with the movements, become motor ideas which *often* incite them.

4th. Since any kinaesthetic sensation may, by proper association, become directly motor, it therefore should not be doubted that sensations which are not kinaesthetic, may, under proper conditions of association, also become directly motor; in short, that any and every sort of sensation may become directly motor, and that, therefore, the whole problem of motor ideas, save in so far as instincts are involved, is one rather of experiential or associational development than of anatomical necessity.

Having reached these conclusions, before following to see how they apply in greater detail it will prove of advantage to examine a little as to why they have been delayed in coming to recognition. Our modern epoch began with scientists, and everyone else, fully possessed of the notion that Will is a super-physical force which meddles with and propels our bodily movements as does any physical force. When this doctrine fell into desuetude, it was followed theoretically by that of Parallelism, wherein mind and matter are no longer supposed to interact. It requires but little study, however, to recognize that Parallelism has never

been fully recognized in practical theorizing, and has been made only hap-hazard use of for satisfying certain special questions. Never has the psychologist sat himself down to consider the full consequences of accepting it as a universal principle. His lack of motive for doing this is again historically clear. The discovery of the motor region of the cortex, by a world still imbued with the idea that Will is a separate function of mind, naturally led men to the notion that human anatomy supported such a belief, and thence onward, as we have already traced, to the muscle sense, kinaesthetic and innervation sense theories. With these, professional physiologists and psychologists have been abundantly occupied down almost to the present hour. This centering of attention upon particular mental states, and accenting of them as specifically dynamic, led inevitably to a tacit assumption that all other mental states are not dynamic at all. If our problem had been reached at the first with full comprehension of what is involved in saying that *all* mental processes are paralleled alike by brain activities, then, perceiving that all brain states must, of equal necessity, be dynamic, our science would thus have been brought to realize from the first that all ideas must be discovered to be in some way motor.

At this point there is likely to arise the thought that our science does already conceive all mental states to be dynamic in the above sense; that it assumes all ideas, even the most abstract, to have *associational* force. It may be claimed that by explaining mental association by brain association, psychology has already accounted for the energy, if we may say so, of *all* possible mental states. And this brings us, as I believe, to one of the most crucial errors heretofore made in our problem, and to one of the most important transitions from traditional views to truer ones that we shall have occasion to notice.

Previous to Prof. James' demonstration to the contrary (and this I incline to esteem to be one of his most important contributions to science), associations were looked upon almost as so many separate marbles rolling around in the brain paths. Under this conception it is easy to think of the force of each being expended separately in setting some other idea rolling within the cortex, and to account for the total energy of all ideas without conceiving them all to be with equal directness motor ideas, the

latter term being saved for those alone whose energy issues immediately from the cortex in the form of muscle innervation. Professor James, however, has made clear that associations are never such separate affairs as above conceived, but are the results of all the brain forces active, unitedly, at a given moment. Under this latter notion, *i. e.* of all the live forces acting as a whole, it is difficult to think of any particular grouping of muscle innervations being determined by anything less than the whole, and quite impossible to think of the brain acting as a whole in association and not doing so in innervation. Had Prof. James carried out his doctrine of associations in the latter sphere, he never could have been content with his kinaesthetic theory. And following it out consistently, this great principle leads us where by other routes we have already been led, *i. e.*, to the conclusion that *all mental states whatsoever are motor with equal FUNCTIONAL directness, though NOT with equal functional strength.*

This conclusion is so at variance with current notions as to warn us that at this point we are passing from history to a fresh analysis of our problem. And to this we will frankly devote ourselves henceforward.

We have noted in our historical sketch how traditional pre-suppositions have colored the interpretations drawn from each new discovery in the nervous system. Wishing to start anew, the suggestion offers itself that we turn back to examine our nervous mechanism without prejudice, and in the light of latest information to discover just what possibilities of connection it offers between incoming sensations and outgoing innervations. And to make our study concrete, let us take the typical case of an incoming retinal stimulation; let us say one that gives me sight of my pen, just as it reaches a point, which we will call *A*, in the occipital sight region of the cortex. We have now to ask: To what muscles is it anatomically possible, or perhaps as is a significant way of putting the question, *was it congenitally* possible to send innervation impulses through this point *A* by means of its incoming visual stimulus? We have seen how, in the early days of cortical experimentation, through interpreting them in the light of false traditions regarding will, these sensory regions, of which our point *A* is typical, were conceived to be never directly motor. It was conceived of every sensory impulse arriving as at

A, that in order to leave the cortex in the form of an innervation impulse, let us say for moving the thumb, it must cross over, through association fibres, to the central convolutions and find its outlet there. Our latest information, however, when weighed free of presupposition, offers an entirely different view of things, for it is now perfectly determined that every part of the cortex is, *potentially*, a point for departing innervations as much as for incoming sensations. In substantiation of this I may quote from Prof. Donaldson, one of the most cautious and able of living neurologists. In his recent book, "Growth of the Brain" (p. 258), he says:

"The distribution of the incoming fibres is consequently such that a large portion of the cortex must receive them, and, judging from its reactions to stimuli, an equally large region must contain cells giving rise to outgoing impulses. The same reactions which lead to the conclusion that the incoming impulses are brought to the surface of the cerebrum, lead also to the conclusion that at this point they pass from one set of nerve cells to another, and that this second set discharges toward the lower lying centres. Thus there is indicated an arrangement by which at the cortex the direction of the nervous impulse is exactly reversed. Such changes of direction may occur in any centre. . . . Granting these points, it is not surprising to find that in a certain sense the entire cortex, so far as it responds directly, is motor, so that the stimulation of it at different points may give rise to muscular contraction. . . . Such designations, therefore, as motor or sensory are misleading, and in all localities are to be found pathways for both incoming and outgoing impulses."

This is clear as to the fact that all points of the cortex are in some way motor, and that, in our concrete case, some sort of direct innervation may leave the cortex from the point *A* where the stimulus from seeing the pen first comes in. We have next to inquire what sort of movements may result from this outgoing impulse. Regarding this we must most carefully distinguish between the movements *congenitally possible* from such an impulse, by reason of adequate anatomical paths afforded it through the lower nerve centres and their ramifying connections, and the movements such a sensation as ours under investigation would be most *likely* to call forth in the fixedly educated adult, and under complex accompanying conditions. As to the primitively possible paths, we may make the general statement with some confidence that there is not a single muscle in the body

which such an innervation might not reach without again ascending to awaken associational influences within the cortex. Moreover, by descending to spread its influence through all the possible reflex combinations of the great basal ganglia of the brain, there is no single combination of movements which such a sight stimulation could not theoretically call forth. This statement is justified by the abundant provision that is made in these parts for cross-connections and inter-connections between the nuclei of all the motor nerves, the final result prevailing that everything is anatomically connected with everything else.

The variety of work thus anatomically open to the subcortical ganglia is one thing. The work actually displayed by them in any given adult is quite a different thing. The two should no more be confounded than the possible tunes afforded by the range of notes in a free keyboard should be confounded with the set range of tunes in a street piano, or with the tune actually picked out by Aunt Jemimy with one finger. There can be nothing more fatal to false conclusions regarding motor ideas than to base them solely on the narrow reactions which respond to application of the experimenter's needle placed at the point *A* of a dog's or a monkey's cerebrum. Such results show only the natural reaction to one fixed stimulus under one invariable condition. But the variety of results open to a fixed stimulus arriving at *A* by reason of the infinitely complex conditions of the remainder of the cortex upon which it falls, with which it must be united as a self-directing whole, *and which shall infinitely change the conditions of the lower ganglia that are to decide the ultimate course of the discharge from A*, these are quite a different matter. Indeed, the variety of changes in motor response that might thus be given even to the application of an electric needle, if we could conceive its impulse to be introduced into these normal and delicately working conditions, would also be an entirely different matter from the "constant rolling of the eye upward and to the left" that our localization experimenters so frequently chronicle.

The truth to be enforced here is that the work actually performed by the lower ganglia, under control of conditions regulated from above, is not so much the result of anatomical necessities, as the crystallized product of limited, life-long, functional education. It is only when we fully comprehend this that we

take the next step and comprehend how varied are the accomplishments that may result, by education, from the reflection of a single visual impulse at *A* upon the combined lower centres. Commonly this has been grossly underrated through traditional exaltation of conscious cortical over unconscious subcortical efficiency. Only when we deliberately enumerate the intricate tasks constantly performed while busily thinking of other affairs do we adequately become aware of the enormous range of motor processes that are carried on subcortically. Whoever duly examines this is likely to become convinced that the large majority of our daily rounds are customarily performed in this way. To recall how intricately and unconsciously one guides his pen in writing, and the pianist coördinates his fingers while reading from music, is but to cite types of processes that throughout life are innumerable. And if with this in mind one then goes back to ask again what range of motor possibility is open to a single occipital sight reflex reflected from the single element *A*, the answer must be very impressively, the range of *even such a "motor idea"* is nearly infinite.

To appreciate the full range of motor possibilities of each and every sensory element of the cortex can never be accomplished, however, by thus estimating the relation it may *separately and individually* enter into with the lower mechanisms. This can be done only by considering that all these elements are potentially connected with each other within the cortex itself, and that by combination with each other the innervation possibilities of each one becomes practically multiplied by those of all the rest. On this point I may again quote from Prof. Donaldson (p. 272):

"The paths by which stimuli arriving along these different lines may reach and affect any of the efferent cells elsewhere located in the cortex, are probably found in the great systems of association and commissural fibres, already described. Any sensation can serve to arouse any group of motor centres which are under voluntary control. . . . This is very important as a fundamental arrangement, because while the primary condition puts each group of muscles into relation with the sense organ with which it has most immediate peripheral association, this second arrangement renders it possible for every sense organ to control the centre for *each* group of muscles, in so far as it is connected with it by paths of associating fibres, and renders possible even the cross-associations between the different sensory areas which are indicated by colored hearing and the like."

In short, then, the conclusion at which we arrive by fresh study of the nervous system precisely agrees with that which we previously obtained from logical criticism of by-gone theories: namely, that while all the sensory elements of the cortex *may* discharge, associatively, within the cortex, and may thus expend themselves in arousing intellectual processes and ideas, yet all are also alike capable of immediate discharge downward to vast ranges of muscular innervation, and are all, therefore, equally potential as motor ideas.

Acknowledging our indebtedness to neurology for clinching this fundamental truth, there remains the problem of determining how and through what laws, from the innumerable stimuli pouring in upon us from birth, and amid the seas of motor opportunities seemingly open to each and all of them, there becomes organized that system of rational and appropriate conduct that characterizes human life.

It is in explaining this organization that psychology becomes of value in our problem, and pays back the debt to neurology. There is no doctrine in the whole of psychology more ancient, more important, or better established than that of association. It is true that, as conceived by Aristotle and by the great English and German schools, the laws of association were little, if at all, conceived to be laws of muscular activity as much as of mental activity. But to-day we may say with certainty that our entire nervous system works on one fundamental plan, and having determined certain laws of association for those cortical activities which underlie our mental occurrences, we may be sure that the same laws govern the associations which are developed between the cortex and our lower motor mechanism in general. Let us, therefore, glance at the main laws of association which have been established in the one field and note how they are to be extended into the other.

It has been found that sensations and ideas which occur most *frequently* together are bound together by greatest associated strength. Carrying this over into the motor field, we may now say that the more frequently any sensation or idea combines with any given motion (either through random or through continually diversifying instinctive development), the more likely is that motion to follow the recurrence of that sensation or idea. In

other words, the more we get into the habit of doing a particular thing upon the recurrence of a given sensation, idea or feeling, the more likely are we to do it. In accord with another well-known law of association, we may observe that the *recency* of any volitional act makes it easier for one to repeat it, and, therefore, the more likely that it should be repeated and for its habit to be clinched. Again, the *clearness and accuracy* of a volitional performance helps to fix its habit. Also those acts which are *emphasized* in any way, as by some emotional accompaniment or by exceptional interest, are the more forcibly riveted to the stimuli which give rise to them. Every one of these ordinary laws of mental association must thus be carried over to explain the rise and regulation of our psycho-motor associations.

Still more important is it to carry over the great fundamental law that every passing association is the result of the sum-total of stimuli and influences active at the given moment. Precisely in accord with this, every muscular response is the result of the sum-total of stimuli and cortical processes active at any moment. Since this is the central principle which meets us at every turn in our problem, let us examine it in even closer detail. What is meant by an association being determined by *the whole* active mind may be illustrated as follows. If one had been listening to Hamlet's soliloquy, and I, striking a pose, should cry out "To be—," a very definite picture would revive in his mind. If, at another time, in the midst of an absorbing problem of algebra, where he was constantly manipulating the quantities "a," "b," "c," etc., I should cry out precisely the same sound "Two b," an entirely different conception would arise to him. Strikingly does this illustrate how the effects of a simple and definite stimulus may be varied accordingly as the content of the whole mind is varied. And as strikingly does it illustrate how any stimulus, or group of stimuli whatever, may become a motor idea for the innervation of any movement or combination of movements whatever.* Herein, as I believe, do we reach the central principle for explaining both the genetic establishment and all passing displays of psycho-motor coördination. They are the sum-total habit-product of the entire nervous mechanism. Just as we conceive the cortex to act as a whole in producing mental associations and ideas, so we must conceive the cortex and the basal,

spinal and terminal ganglia, even to the grasp by these latter, of the muscles themselves, to act as one whole in the formation of our motor habits and in their execution. We must never think of the cortex *controlling* the lower ganglia in the absolute sense, for every so-called "control" is a habit learned *between* the higher and lower circuits acting as one. Moreover, those parts, both of brain and of body, which together lie passive while the remainder reply to their appropriate stimulus with simultaneously coördinated response, they also learn this self-suppressive and inhibitory *coördination with the active portions* under one total habit bond, and in the establishment of this bond the acquirement and the display of the *passive* traits proceeds by precisely the same law of association as does the development of the *active* coördinations. Everywhere the nervous system is one universal mechanism with one set of laws applying universally throughout.

Under such a broad conception as this, we appreciate how erroneous and misleading it is to set apart any one kind of sense, or any one set of ideas, as the only "motor ideas." The great truth is, that fundamentally, any mental state whatever, the most simple or the most complex one compounded of muscle sense, of sight, of smell, or even of pure and unadulterated emotion, *may*, under proper conditions, become the psychic trigger to any motor combination whatever. Thus the smell of smoke, or the cry of "fire," or an impulse of fear, may become as directly motor as the "stroke" of the knee jerk. Or the delivery of the 42nd Proposition of Euclid could be trained to as immediate effect as the shifting of a musket at the command "Shoulder arms!"

With this general plan before us, it should not be difficult to trace out how it is that a babe, born comparatively destitute of organized habits and capable of an infinite range of possibilities, grows up to become so fossilized to given stimuli, that we may predict with tolerable certainty what he will do in appropriate accommodation to the enormously complicated and varied conditions of adult life. Were the law of "frequency of random habit" the only law that should be operative, yet it would necessarily result, in the long run of time, and under prevalent groupings of stimuli in the environment, that certain correspondent cortical groupings would acquire stronger inclinations to call forth certain coördinations of movements than other coördinations

Again, since different states of mind would, at different times, play upon the same muscles, yet with different groupings of coördinative frequency and strength, so, therefore, certain states of mind would gain greater control over certain muscles than would other states of mind. Again, since certain states would thus accidentally learn the habit of flexion, while others would learn that of extension for the same group of muscles, so, therefore, there would arise opposing inclinations among the different simultaneous complications, which oppositions would eventually resolve themselves according to the relative strength of the several components, the final outcome being decided by the entire mental combination acting as a whole, calling out a particular complication of conduct as a whole.

Thus from primitively random movements alone would be developed conduct as complicatedly and intelligently adjusted as is our life, provided that the accomplishments of one generation could be accumulatively passed on to the next, and we could thus be enabled to look upon the development of the race as the slow development of a single individual. Now the development of inheritable instincts does enable us to look upon our problem from precisely this standpoint. How these instincts are themselves evolved, and whether by Weismannian or by Lamarckian principles, we need not here inquire. In any case, they serve the same purpose of fixing those accidental coördinations which prove "survivingly fit" for the creature's welfare, and of handing them on, cumulatively, from parent to child. An instinct is an inherited inclination to do or to think or to feel a definite thing. It resides, ultimately, in the congenital tendency of any certain neural group to discharge toward any other group; and whether it is confined within the cortex, or governs a discharge from the cortex downward to the muscles, still its origin, its nature, and its operation is the same in both cases. In brief, it is an inherited association; as such, it deports itself like all other associations of equal complexity and strength. In its relations to other combinations, and in the further complications and developments in which it becomes involved with them, it is governed by precisely the same laws of contiguity, frequency, recency, proficiency and strength which govern the development of all associations, both ideational and motor. As to the associational strength of

instincts, some are strong and some are weak. Some last through life, incapable of coördinative modification, as, for, instance, the local reflexes governing the beating of the heart. Some are fragile, and failing the precise stimulus and environment which is natural to them, die out. Some are obliterated in acquired modifications, which are greater than their own inherent strength. Others, meeting proper conditions, develop normally and last during life. These constitute the bulk of our nature. For indeed we must look upon all possible thought and conduct of man to be "instinctive" in widest sense. It is absolutely true that there is no conduct that is not partly determined by the inherited peculiarities of our mechanism, and that is, therefore, instinctive in a proportional degree. Nor is there any limit of age at which they make their appearance. Dispositions change, predeterminedly, late in life. Old age and death itself are in a marked degree instinctively predetermined from birth.

As to the number and the complexity of the instincts with which we are equipped at birth, former psychology conceived them to be few, compared with those of lower animals, and modern psychology has got so far as to declare that "man has got more instincts than any other animal." Precisely what our inherent endowment is, is certainly hard to determine, since, as we have seen, there is no act of the adult that is not partially instinctive, and since, because of our ignorance of how and when our instincts develop in the embryo, we are at present unable to tell, even of our natal capabilities, which of them are truly inherited instincts and which are pre-natally "acquired." We may, however, now safely declare that our instinctive endowments are innumerable; are indeterminably complex and pervasive; and that many of them continue through to, and even make their appearance in, old age.

Having reached this point, it should now be tolerably clear how our motor capabilities develop. First come a goodly stock of instinctive tendencies. These, under a variety of stimuli, begin the work. By means of them, and in complications of them, innumerable "random" combinations are also made. Rapid developments then accumulate from their joint product in accord with the general laws of association. As a consequence, definite habits crystallize out. The mother and the nurse assid-

uously suppress certain of them and encourage others. Education begins. Life becomes a routine. The individual falls under the environment of society and civilization, which is the accumulated achievement of the race from the beginning of time.¹ These accumulations, acting as *conventionalized stimuli*, soon train the growing shoot to a result more or less near the common average according to individual talent and the surrounding circumstances.

In summary, therefore, the problem of tracing the motor development of any given individual demands all these things: We must know his anatomy and his physiology. We must know his inherited traits. We must note every slight event of his infancy. We must know his parents and his daily surroundings; his home, his town, his nation, his race, the age and civilization in which he lives. It is because of the need of all these that modern physiology and psychology have now become closely allied with comparative biology and natural history; with child study, which is fast becoming a science in itself; with anthropology; with history; with education in its largest sense; and with sociology as embracing all.

There are still required a few words regarding special problems. Attention, inhibition and automatic regulation between higher and lower centres have become such crucial chapters in the modern motor problem that they can not be here passed over in absolute silence. It will suffice, however, to remark that, with growing knowledge of neurology, physiology and psychology, these mysteries are likely to be unravelled without invoking further principles than those upon which science, as above indicated, has already laid her hands.

Finally comes the old problem of the will. It may be thought that I have left little room for a matter which has filled so great a space in history. But, in truth, I have been discussing the will, and nothing but the will, from the first. This should be understood the moment we clearly define will. If we limit the word to those cases where we say with conscious deliberation "I will do

¹ Achievements which have accumulated by the same process as that now under description, *added to deeper organic developments*, which have been initiated, whether by Darwinian, by Weismannian, or by Lamarckian methods, we do not yet know how.

so—Fiat!” then, as a matter of fact, such cases occur with comparative infrequency. Almost the whole bulk of the transactions of life fall under the same reflex categories with pulling one’s hand from the fire, or shutting one’s eyes to avoid a blow, or ascending the steps and feeling for one’s keys when reaching home. The difference is alone that of complexity, and the principle under which they all are developed we have sufficiently examined.

The few cases where we do deliberately say “I will” are easily explained. Throughout life we form the abstract *concept* of “our bodily self doing things”; precisely as we form concepts of other events. This concept of course has a definite neural basis, which in turn has strongly developed associational strength for those particular doings, or motor acts, *which in their previous occurrence have built up the concept*. When this concept of “self-doing” is aroused, it has, therefore, natural associational inclination to issue into actual incitement of the act conceived. And if not checked by other considerations this “self-doing” becomes the actual “I will it. Fiat”—all in strict accord with the same laws of reflex psychomotor coördination which we have sufficiently discussed.

¹There is but one plan for all forms of the Motor Problem throughout. For the good of Ethics, of Morality and of Human Welfare, the sooner this truth is broadly recognized the better. For the moment the world fully perceives that the right decisions of each passing moment depend, for each and every individual, *absolutely* on the previous development of proper habits of body and mind, and these in turn upon favorable inheritance, upon early surroundings, upon *individual* opportunity, education and environment, and upon the *general* moral, social, industrial and political enlightenment of the age—then, and not till then, will these things be given proper place in the world’s economy. Then, and not till then, will mankind at large be lifted with the full force

¹ Most of what is called Will in the history of “Free Will” and that gives perplexity to the naïve man who studies that problem, is not Will at all, or but remotely so. Rather the power to *entertain* alternative propositions is mistaken for power to *execute* them. Thus one can *think* of eating his cake and keeping it too. But he cannot really do so. When one or the other has been done, the psychologist, if given the details, can always trace out the lawful associations and processes which inevitably led to the accomplished fact, precisely as in any other sequence of psychomotor “cause and effect.”

of the only principle by which it can be lifted; by one, inherently divine, undivided method of Religion and of Nature.

In brief, then, our Motor Problem stands as follows:

- (a) All sensations and mental states are motor.
- (b) The entire neuro-muscular organism acts primarily as a whole.
- (c) The laws of association are universal for the entire nervous organism, motor as well as mental.
- (d) Our instinctive capabilities, multiplied and complicated in their development in accord with these laws of association, abundantly explain the definite rise of psycho-motor habits, and the variety of reactions which constitute psycho-motor phenomena.
- (e) "Inheritance," "Education," "Opportunity" "Environment," individual and social, are the watchwords for future Economy, and for future Religion.

TRAINING SCHOOLS FOR NURSES IN HOSPITALS FOR THE INSANE.

By P. M. WISE, M. D.,
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That a prophet is without honor in his own country and his own time cannot be said of our honored ex-president who, in 1879, conceived the ideal training school for insane hospital attendants and subsequently under considerable difficulties and without precedent carried it to realization for the first time in any country. It is true that from Nightingale's efforts at the St. Thomas Hospital the general hospitals gradually developed efficient training schools; but their adaptation to insane hospitals presented difficulties that seemed insurmountable. It was the work of Dr. Edward Cowles in the McLean Hospital to illustrate his teachings. It is just to state that this example, supplemented by constant and indefatigable efforts to spread and teach the principles that must underlie successful efforts, and the spirit that must prevail and be sustained within the organization, has had the greatest influence in hastening the success that now appears to prevail in some degree quite generally. A few contemporary efforts were made to teach attendants by lectures and recitations in other institutions, but they failed of the success sought for by reason of immature and ill-digested methods. The speaker can refer freely to failures as he was a party to an unsuccessful effort.

The occupation of attending and nursing the insane has never, previous to the present epoch, been sufficiently attractive, nor has it offered inducements of a nature to attract to it persons capable of the training that now seems desirable and even necessary for the modern insane hospitals. Attendants, as a rule, belonged to the servant class. The motive could only be a philanthropic one when exceptions existed, else the service was one of necessity to gain a livelihood only, and consequently was made a makeshift to more permanent and congenial employment. The

future of an asylum attendant was not alluring, much less than that of the country school-teacher. There was no potency in anticipation. Life in an asylum ward, with its humdrum routine, was not more attractive than that of a kitchen maid and about as remunerative. The foreign element in public institutions, in its paid and in its dependent population, was proportionate when the former was not in excess. This remains true at the present time of some institutions into which the spirit of reform has not yet filtered, but with the blessing of progressive enlightenment, an improvement in the character of employees entitled to the name of nurse may be anticipated.

The primary cause of failure in insane hospital training may be safely assumed to have been the lack of inducements sufficient to attract into the service of the hospitals a class susceptible of training or having the necessary preliminary education for it. To such a class there were open other avenues of occupation more alluring. The selfish motive of training nurses for the care of mental diseases only, which would require them to continue in the service of an institution, repelled the better class of applicants; and it was not until the hospital feature was vitalized and emphasized, and the training gave the student an anticipation of future usefulness outside the hospital that improvement in the character of applicants for the training school became apparent. I believe I am stating the common experience.

To attract and retain desirable candidates for the training school, the recognition of training school students as a class is requisite. I believe this class distinction should be quite arbitrary. An inquiry extending over a number of years and applied to a large number of desirable persons at the time of their retirement from the hospital service, leads me to believe that without the grading of nurses apart from ordinary attendants, especially in the large public hospitals, improvement in the character of applicants will be very slow.

Among the chief reasons alleged by attendants of the higher order for leaving the service was the quality of their associates and their aversion to mixing with them socially. If they held aloof, they were assailed by subtle but nagging reflections which it is not within the power of any superintendent to prevent. A difference of title alone exerts an influence that may create quite

sufficient class distinction. In New York the superintendents acting with the Commission have created a schedule of employees which grades them to distinguish members of the training school from ordinary attendants, and when graduated from the training school they are scheduled as nurses and receive advanced pay. The result of this distinction has unquestionably been to attract into the service persons of higher grade. Any superintendent acquainted with the service in New York hospitals before and since this practice went into effect must admit this as an influence in improving the nursing service. It would be desirable when it is practicable to make a distinction also in living accommodations. A separate mess might be desirable. Social functions for students and graduates only would increase the desire of attendants outside the favored circle to so improve and conduct themselves that they might also gain this privilege. There would be a constant example of a higher order of things available to the worthy and the seeker. I have known attendants whose preliminary education precluded their entrance into the class, stimulated with a desire that led them to study and an earnest effort to retrieve their wasted opportunities, in several instances with marked success. Doubtless, ability gained by such exertion is reasonably certain to be progressive.

It may appear a trivial question—that of considering all the enviroing influences which go to make or unsettle the prospective nurse, but I believe this consideration is necessary and human motives must be recognized and treated with an almost commercial tact. If the reasons for individual discouragement are secured, they can lead only to the conclusion that the true nursing spirit must be abetted by material things that will bring physical contentment as well as foster aspirations, and be free from degrading associations. This, I know, is often devoutly to be wished for where it is in great part unobtainable, but it is wonderful how much can be accomplished under adverse circumstances when the enthusiasm of the superintendent becomes contagious. The stimulation of a proper *esprit de corps* and attention to the individual welfare of the aspirant, are potent elevators of the nursing service and cannot be ignored.

In ward promotions also, graduates and advanced students should have a prior claim, even if a practical purpose can be

better served in the promotion of an ordinary attendant. This should be an established principle which should not be disregarded frequently. No particular claim for promotion by virtue of training school connection need be recognized until the student has successfully entered the second course of study. Students should not be permitted to pass beyond the primary course of study if they are unfitted for superior work, by temperament, physical weakness or idiosyncrasy. Incompetency of any kind should be a sufficient bar to advancement, and where the latter is permitted it should be *per se* evidence of capability.

It is a mistake that has frequently been committed by hospitals in their primary efforts to establish a training school, to depend upon lectures by the staff as the basis of the school, and as its chief feature. These should always be considered as supplemental to class room and clinical instruction, and their value lies in giving the student an opportunity to receive another form of instruction upon subjects taught in other and, I believe, in more effective ways. It drills the nurse in exercising a careful observation and retention of spoken language, especially if the practice of note-taking be insisted upon. It trains the attention and it presents important subjects in a new and attractive manner. It has been the practice, and I believe it still is in a few hospitals, to depend wholly upon lectures for instruction. This may be very useful and the effort is not lost, but it does not constitute a training school by any means. It should not be called one, for such a designation would be misleading. A practice that had been followed to some extent by my associate medical officers, was to give instruction by lectures to attendants not in the training school, in order to make them more familiar with the rules of the institution and to demonstrate the proper custodial care of the mentally disabled, but these lectures were not considered as constituting any part of the training for nurses.

Another mistaken effort leading almost invariably to failure is the dependence upon medical officers for the required work of training. The successful school needs an organization in which medical officers should be a part, but not the larger part. It cannot be expected that they will spend a great part of their time at the bedside and in the class room with students when they have the medical care of a hundred and sometimes hundreds of pa-

tients. They can well supply the animation and the *vis a tergo* when the superintendent keeps the pot boiling, but the details are beyond their possibilities and should not be dependent upon them. We are promised a manual of organization from a master, and the committee on training schools may report it at this meeting. In view of this, any suggestions I might offer now upon this feature would be superfluous. I will only emphasize what is truly important, in fact what is a *sine qua non* for a training school, which is a thorough organization, with the several departments of the school properly adjusted and harmonizing—working together.

The hospitalization of our asylums assumes the creation of hospital wards in their general sense, and where these are properly organized, clinical teaching in general nursing becomes a simple matter, and at once promotes the training school to its proper dignity. In our large public hospitals for the insane there is a sufficient number suffering from bodily diseases, which, if aggregated, would make a respectable general hospital. There should be a number of these wards adequate to permit each student three months' service under skilled direction in each year of the course. There is also a number of special cases requiring a special nurse, and these cases usually require skill both in mental and bodily nursing. There should also exist a sufficient flexibility of the ward service to permit the senior students or graduates remaining in the service to respond to outside calls. If the physicians in the community know that nurses can be obtained from the hospital, there will be a sufficient number of calls to provide an impetus for superior work and a knowledge of general nursing. Each nurse engaged in outside work will be an advertisement for the school, and will assist materially in diffusing a knowledge of the hospital's usefulness and beneficent work. It will also promote encouragement for superior persons to engage in the service.

In my introductory talk to those intending to enter the training school, I have usually described in considerable detail the chief distinction between a training school course in a general and in an insane hospital, in order to give the candidate an opportunity to retire before the course is begun. I consider this important, for, with all the instruction that may be given by circulars and

letters, applicants misapprehend the purpose of the school. I believe that nurses properly trained in an insane hospital are better adapted for the care of most bodily diseases than nurses trained in general hospitals. I do not hesitate to tell the class so nor do I hesitate to tell them why. As Dr. Cowles has said, the effect of the training in an insane hospital develops certain qualities of patience and tactfulness, which general hospital nurses often fail in, but which the general physician is quick to appreciate. This is developed by the tact and patience demanded in the care of nervous and insane cases, and the general hospitals have not the conditions for cultivating it as well. In order to prevent future discontentment and regret, it is well to have the student understand at the outset the particular advantages presented by the course to be undertaken. At the same time it is better to give frankly the deficiencies that are unavoidable for some branches, particularly surgical and obstetrical nursing, but to encourage the student in anticipating a post-graduate course to supply them.

For the foregoing reasons it is a serious error, as a rule, to draw teachers for the school from general hospital graduates. They have been taught too strictly objective symptoms, and there must be temperature, redness, pain or swelling to attract them. Psychic pain and psychic fever do not appeal to them, for they have not been taught to observe the subtle mind symptoms that really exist in some degree in nearly all serious diseases; whereas the special hospital nurse has lived in an atmosphere of disordered mind signs, and the recognition of nervous symptoms, their proper observation, care and record have become almost intuitive. It is better to select nurses who have developed in the right direction and have the general qualifications from the home school, and supply their deficiencies by liberally sending them to the needed post-graduate courses, keeping in their view the reasonable length of service they owe to the parent school.

I have failed to speak heretofore of the care which should be exercised in issuing certificates to nurses that graduate out of experimental schools. The work of the engraver is not required until the school is undoubtedly a success. A motive for undertaking the course should not be the possession of a beautiful diploma with a seal and a red ribbon attached. I have often been

embarrassed by the application of persons for the nursing service in recent years whose qualifications I could not approve, who would indignantly show me a diploma which I had authorized during my infant efforts at training a decade before, but had wholly forgotten. Unless the training is sufficient to produce a nurse in a general sense, the certificate should state what the possessor is capable of doing and should not certify to her proficiency in nursing. I am sorry to say that there are many of such unearned certificates floating about my own State.

Another error may be made in the enthusiastic early efforts in establishing a curriculum that will require the student to study theory to a needless degree. The safe limit is to teach only necessary things. In insane hospitals a natural tendency is to go too deep into psychology, and the effort to make the student comprehend subjective psychic states may be carried to excess and interfere with more important matters. The nurse requires only that knowledge of mentalization which will give her the capacity to recognize the commoner mind symptoms entering into ordinary clinical observation. Any attempt in the training school to make psychologists in a two years' course will lead to lamentable failure. The same precaution applies to any department of didactic teaching. There must be a careful discrimination of the border line between nursing and medicine. Of what possible value, may I ask, is the quite complete course in *materia medica* required in some general hospital training schools. For these reasons and others which I have failed to state, I believe the successful training school must have a well-digested curriculum established for the full course, with its limitations well defined, and should also have a complete calendar. In this way only can the ground be covered. Desultory teaching is impracticable where the time is so short and the student has other duties to perform, but the exact day and hour when each subject will be considered should be appointed at the beginning of the course for the year. This should apply not only to lectures and recitations but to clinics and practical work. Appointments should be observed with exactness and the same precise methods should be taught by school example as is expected of the nurse in her official work.

The superintendents and the State commission in New York have taken concerted action toward establishing uniform methods

in the training schools. Thus far there has been accomplished a uniform course of two years, with the use of the same text-books, and progress has been made toward the adoption of a uniform curriculum. Students from all the schools are required to pass the same examination which is under the charge of a committee appointed by the board of superintendents. When the plan was put in operation an examination was made of all graduates from former training schools to ascertain their merit and fitness; and such as were found qualified were certified as nurses, and received that title to distinguish them from attendants. They also received additional pay. It cannot be anticipated that absolutely uniform efficiency will prevail in the several schools except as an evolution, but this may be hastened and directed by concert of action. There are local conditions which may retard or facilitate a desirable standard. These if unfavorable may be greatly modified if the presiding officer is determined and persistent.

DISCUSSION.

DR. H. M. HURD.—I desire to state that Dr. Cowles has written me that he will not be able to present his manual at this meeting, but that he has made excellent progress upon it. He has been under a severe strain in building and organizing the new McLean Hospital. I think, however, you can confidently expect the manual by the next meeting.

I have been interested in this paper of Dr. Wise in connection with the conclusions we are reaching in general hospitals regarding the teaching of nurses. When training schools were first opened, it was customary to ask the physicians of the general staff to deliver lectures, because it was thought that many of the nurses could not apply their minds to abstract processes and sit down to learn from books. Hence, lectures were given, as they are still in many of our medical schools. This practice continues in many training schools. It is, however, becoming evident in all good training schools that more attention must be paid to recitation and class-room work, and that certain subjects must be taught almost wholly from text-books. I predict that within the next five years the curriculum will embrace more text-book instruction and less lecturing.

Another point which is to be considered is the necessity for a longer period of training. I know of many training schools with but a single year of teaching, which we all know to be too short. When a movement was first made in favor of lengthening the course to two years, everybody said there was great danger of overtraining the nurse. Experience has shown that there was no danger of that, and it has since been found that two years are not enough. The best training schools are now adopting a three-year course, and within a short time there will not be a good hospital training school in the country with a course of less than three years. I believe that training schools in institutions for the insane must adopt a course of equal length. It is unfortunate that we can not combine the teaching of nursing the insane with the teaching of general nursing. If some method could be discovered whereby water and oil could be mixed, whereby nurses beginning in an asylum could be interested in general hospital work and vice versa, much good would result. In the near future no hospital for the insane will be satisfied with less than a three years' training.

DR. GEORGE T. TUTTLE.—I agree with Dr. Wise that the organization of a school is very important. A wrong beginning necessitates changes, causes loss of time and perhaps discouragement. Some one person under the direction of the Superintendent of the Hospital should be in charge as Superintendent of Nurses. The question at once arises whether one would better go outside his hospital for such an officer or take some one from his own institution. If the former course is pursued, it would be better to secure the services of a graduate of some training school of a hospital for the insane rather than of a general hospital, because the latter is not accustomed to the work that would be required of her and probably would not be successful. In my opinion it would be better to select a head nurse or supervisor who is already familiar with the hospital and its methods and send her to some school for a course of study.

The selection and instruction of such a person is a long step in the right direction toward the organization of a training school. Then, as Dr. Wise has said, it is further necessary that there be a large corps of instructors. Nothing is more important than this to give permanence to a school.

There is a movement now in the direction of an increased length of the course of study, and I agree with Dr. Hurd that three years is none too long, although it may be some time before it can be everywhere accepted.

It is universal experience that it is easier to establish and maintain a school for women than for men. Women are naturally better fitted for the work, and there is a greater demand for their services after graduation. It is for them a profession, while few men nurses are regularly employed in private work, perhaps because they hold their services at such high rates. It may be that a greater supply would regulate the price and create a demand. The home treatment of the insane is certainly increasing, and it is rendered possible only by the fact that competent nurses can be obtained. It may be that in time this problem will solve itself and the male nurse will have a fair chance for employment if he has fitted himself to render proper service.

However that may be, we must instruct the men in the hospitals. There is quite as much need of intelligent service from them in our wards as from women. A few of them come to the McLean with the intention of studying medicine, and they find the instruction in the school and their work with the patients of great advantage to them.

Thus far we have not been able to keep so many of our graduates in the service of the hospital as we desire. Quite a number of the women go to the training school of the Massachusetts General Hospital each year for further instruction and experience in the care of ordinary acute diseases, and there is an arrangement whereby they receive a diploma from this school at the end of one year. While many go to the General Hospital, it is exceptional for one of their nurses to come to us. The General Hospital nurse is not interested in the care of the insane, and if such knowledge is to be obtained, it must be had before she has become accustomed to the care of the acute cases of ordinary diseases.

I think the very best sort of a nurse, other things being equal, is one who has taken a two years' course in a hospital for the insane, and, after this, a year in a general hospital.

DR. H. C. EYMAN.—I cannot do more than say what we have done at the Cleveland Hospital. In 1891 we organized, but un-

fortunately started wrong. We then thought the instruction could be carried on entirely by lectures. Now it is mostly done by the use of text-books. We use Dr. Wise's and Dr. Burr's, as well as other text-books. Our instructors, however, are taken wholly from our medical staff. We have four regular physicians who do the teaching. Of course, those who have graduated in the school act as clinical and bedside instructors. I have experienced the same trouble spoken of—that of getting a less intelligent class of male than of female attendants. I attribute that to the fact that we give the females a pretty fair salary, and while the males get a little more, it is not a fair salary. Our course is two years, and we have graduated sixty-three nurses and the school has been a great advantage in raising the intellectual standard of our employees.

DR. ARTHUR W. HURD.—The training school of the Buffalo State Hospital has reached the age of thirteen years, and while I was not connected with the institution at the time of its inauguration, I have been familiar with it for nine years and can say that no other one agency has been of such utility, not only for the benefit of the patients, but for the attendants and physicians as well. We are now called upon to supply nurses in many private cases of illness in this city and in Western New York, and are frequently asked for nurses for other institutions; and only recently one of our graduates was appointed head nurse in a city accident hospital over forty-six competitors. We have had the same trouble as Dr. Tuttle, viz., in retaining our nurses for ward service, as they are somewhat sought after. The methods of teaching, of course, have changed; there is less didactic work and more of text-book and recitation work.

The remuneration which they receive from private patients is allowed to the nurses wholly, and it is one of the rewards of the school. We have applications constantly from a number of medical students, and we have several now on duty. The whole tendency of the school has been to elevate the profession of nursing the insane to establish a certain *esprit de corps* unknown before. It results in our getting a much better class of applicants, which is of great benefit to the staff, as any one who has experienced the beneficial effects of teaching can testify.

NOTES UPON THE EPILEPTIC AURA, WITH REPORT OF SOME RARE FORMS.

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From time to time it seems desirable that we should formulate the latest advances of our knowledge about the various phenomena of disease; in no field does this seem more desirable than in our study of epilepsy. That which should attract our attention first in a clinical sense is the aura or warning. The aura of epilepsy is so elusive and indefinite that it must be approached with great care in order that we may obtain an accurate knowledge of its nature. Although such statements are old, they will bear repetition as often as we have occasion to study this fleeting stage of an epileptic fit. Unless one bears such a thought constantly in mind he is almost certain to make mistakes at every turn of his investigation. As the aura portrays the onset of the furious nervous storm which follows, it is absolutely essential that we should give it careful attention first, in order that we may form a complete concept of epilepsy.

At the very beginning of our study of the aura we meet with many difficulties. Obviously, epilepsy cannot be studied to advantage when much mental impairment has taken place, and again, because the symptoms of the aura are almost entirely subjective, the patient's statements must be weighed carefully before being accepted as final. Before any neurological significance of his aura can be entertained repeated examinations are necessary, until it is found that the nucleus of the patient's statements agree in substance throughout.

At various times writers upon epilepsy have laid special stress upon the aura; some consider it a symptom pointing to a favorable or unfavorable prognosis, according to the kind and character of the aura; others have maintained that the aura indicates

the seat of the earliest nervous discharge in the cortex, and the area in which the discharge ultimately is most complete. Still others have laid great stress upon it as indicative of the peripheral origin of the seizure which was referred to special motor and sensory functions; limited space forbids our considering each of these views in the light of recent investigation.

In considering cases in which the special sense auræ are present, we would naturally infer that olfactory and optic disturbances would be most frequent because of the direct connection that these special sense organs have with the brain proper. In a careful review of 241 cases of epilepsy which have been admitted to the Craig Colony, the special sense aura of sight was found most frequently, and but one case of the sense aura of olfaction was observed. Why the disturbed sense of olfaction is so rare in epilepsy when this sense has fully as direct a connection with the brain as has that of sight, is a matter for further study and investigation.

The sensation of great fear, as of impending death, which is not infrequently experienced by the epileptic in his sensory and psychic aura probably is not so much dependent upon the attenuation or loss of consciousness as it is upon the disturbance of cardiac and respiratory rhythm. In two or three cases in which this aura was habitually present, the patient stated that the fluttering feeling in the cardiac region (palpitation) and the inability to breathe were recorded long before the conscious state had become materially impaired. One can easily understand that such important functions as that of respiration and propulsion of blood when interfered with would materially affect the whole sensory apparatus of the organism.

Again, the epileptic cry is frequently said to be due to an expulsion of the residual air of the lungs, caused by convulsive compression of the thoracic muscles diminishing the capacity of the thorax, but this cry is frequently prolonged and consists of many inspiratory as well as expiratory acts and is probably due in a great measure to the clonic spasm of these muscles. Again, it seems quite probable that some cortical disturbances in the speech area are also present, as the patient not infrequently articulates words as well as utters the prolonged cry.

A fact of great interest in studying the aura of epilepsy is that

certain widely different areas of the brain may be simultaneously exploded or disturbed and give rise to auræ of different kinds which are associated at the same time with each other,—the so-called mixed auræ.

If one accepts the ideas of liberal writers upon cerebral localization it is not so difficult to account for the origin of two apparently widely different areas of disturbance in sensory realms. We believe that almost all authors now maintain that sensory centres do not admit of so clear a definition as motor areas, but occasionally widely different sensory and motor phenomena are manifest in the same case; to form a satisfactory or adequate theory for such a case is very difficult. We must be content with conjecture until the true physiology of the cerebral cortex lights the way.

The great frequency of the epigastric aura finds a satisfactory explanation in the general statement of Mercier,¹ who localizes the peripheral sensory sensations in the epigastrium because he believes that in primordial life the stomach or epigastrium was the earliest and most important seat of pleasure and pain.

Cases have frequently been reported in which the unstable, discharging centre of the epileptic's cortex has been completely exhausted by repeated explosions, each discharge being more severe and exhaustive than the other, but cases of epilepsy in which the motor aura acting as a seizure has completely taken the place of an attack, are very rare. A case which is at present under the writer's observation has shown this peculiar epileptic phenomenon. Commonly for several hours before an attack and occasionally for an entire day, the patient has a convulsive movement of both arms, finally causing him to raise them to maintain his balance. This muscular movement occurs every few seconds during the progress of the aura without his once falling. Although the patient may do his work in the meantime, he is very irritable and rarely recognizes the fact that he is passing through an epileptic aura and may soon have a true convulsive seizure. He shows by his manner and speech that his state of consciousness is considerably disordered. Occasionally after a severe at-

¹Take's Dictionary of Psychological Medicine, Vol. I, pages 253 and 254, Chapter upon Consciousness.

tack, these flurries following the regular convulsive storm continue for hours before he returns entirely to his normal interparoxysmal state. Quite frequently the patient passes the entire day in this peculiar state of consciousness attended by incoordinate muscular movements which are not ultimately followed by a general convulsive seizure. An additional interesting feature of this aura is that it occurs in an idiopathic epileptic and no trauma has ever been alleged. The etiology and pathology underlying such an aura are still unknown. This patient has been under the writer's observation daily and almost hourly for the past year. Such a case of epilepsy presents an unusually interesting opportunity to study the manner in which consciousness is attenuated and finally lost. Undoubtedly this man at times holds the entire mystery of the pathogeny of an epileptic fit,—its motor and elusive sensory phenomena. How unfortunate that we are not to be able to see that mysterious mechanism! This patient is still intelligent and seems remarkably devoid of the emotional characteristics which are frequently seen in cases clinically allied.

While present authorities hold that the aura represents the area of the brain which takes the initiative in the seizure, we must remember that this can be only the fulminate which starts the discharge, whereas some other area might begin the explosion if the seizure were but a little delayed. This one fact shows that the greatest study and endeavor should be directed toward ascertaining the exact cause of the great instability of the whole cerebral cortex.

The writer desires to embody in this article some uncommon forms of epileptic aura which, in the light of our present knowledge of the functions of the nervous system, seem like mere vagaries of the epileptic's disturbed mental state.

Case I.—*PHRASE RECURRENCE.*—Patient states that prior to her attacks she has a recurrence of phrasing, which differs from normal thought, as it is recurrent and grows more intense at each repetition. The phrase is "nicht wiedersehen." This aura has been present prior to most of her attacks for the past year. Occasionally the phrase changes to "auf dem reirdem." She states that there is no apparent connection between the occurrence of these words and normal thought in everyday life, and that she does not know the meaning of these words. She has

never had insistent ideas or word dominance of phrase rhythm. At no time have these recurrent phrases been present after the attack or in the interim. This is a rare psychical aura.

Case 2.—AURA LACHRYMALIS.—Patient states that about two hours before an attack he has a stupid and confused feeling and that about fifteen minutes before it occurs he feels very depressed and has an undefinable sense of fear. At times during the aura he weeps and cries loudly, while at other times he weeps quietly by himself. This peculiar aura makes its appearance prior to about one-half of his regular epileptic seizures and continues until the convulsion occurs, which usually begins with an opisthotonic contraction of the extensor muscles, lasting for twenty or thirty seconds.

Case 3.—PAIN IN HYPOCHONDRIUM.—Patient has a sense of pain in the left hypochondrium, which is located in the muscles of the side. This aura is present before about one-third of her attacks. Gowers states that this aura has never been observed.

Cases 4 and 5.—DREAMY STATE.—These patients experience a "dreamy state" about one-half hour before each attack. During this time they are stupid and incapable of performing simple acts. These auræ are present before all their attacks but are never found in the interim, nor do they take the place of an attack. Depressed states of this character have often been commented upon by Hughlings-Jackson and Gowers, but always as a phenomenon which takes the place of a regular seizure, not as an aura.

Case 6.—MIGRAINE.—For ten or twelve hours before an attack patient is afflicted with migraine, which is localized over an area $2\frac{1}{2}$ inches in diameter at the left temple. The pain is persistent and severe up to the time of the seizure. Occasionally this takes the place of a seizure and always disappears as soon as the seizure ceases. Occasionally this aura and the seizure may be aborted or prevented by proper treatment with salicylates. The association of migraine and epilepsy has long since been fully treated by various writers, but an attack of migraine acting as a distinct aura has been but rarely noted.

Case 7.—SPASM OF THE MASSETERS.—Patient has a clonic spasm of the masseters. The teeth chatter for an hour or two before the attack begins, loudly enough to be heard many feet

away. Patient's teeth have been entirely destroyed by such forceful movements.

Case 8.—OLFACTION.—The aura is of the special sense and distinctly one of olfaction. An odor of "wood smoke" is noticeable before about one-third of his attacks. But one other case of a similar character has ever come to the writer's notice.

Case 9.—ANALGESIA OF TONGUE.—Patient states that for ten or twelve minutes before an attack begins there is entire loss of sensation in the anterior half of the tongue. It becomes numb and she is unable to speak because of the loss of control of the tongue. There is a carefully and accurately defined sensory and motor aura associated in the same case.

Case 10.—PAIN IN RIGHT THIGH.—Patient states that the aura consists of a lancinating pain in the middle of the right thigh. It persists for fifteen or twenty minutes before the attack. Generally the attacks occur in series.

Case 11.—PERIPHERAL ANALGESIA.—Patient says that the aura is very persistent and exists as a numb feeling over the entire periphery. It is sudden in its onset and gradually fades away, only to reappear every two or three minutes until the seizure occurs.

Case 12.—CHILLY FEELING IN LUMBAR REGION.—Patient has a "chilly feeling" in the lumbar region for hours before an attack. A sensory aura in this region is very rare.

AURA OF FEAR.—Three cases have an undefinable sensation of fear and a desire to escape from the room without actually making an effort to do so. This has also been commented upon by other writers as a *petit mal* attack, but in these cases it is a distinct aura and ceases as soon as the attack begins and is never present in the interim.

American Medico-Psychological Association

PROCEEDINGS OF THE FIFTY-THIRD ANNUAL MEETING.

TUESDAY, MAY 11, 1897.

FIRST SESSION.

The Association met at 10 a. m. in the Hall of the Medical and Chirurgical Faculty of Maryland, 847 North Eutaw St., Baltimore, and was called to order by the President, Dr. T. O. Powell of Georgia.

Dr. George H. Rohé introduced the Hon. Lloyd Lowndes, Governor of the State of Maryland, who said:—

Mr. President and Gentlemen of the American Medico-Psychological Association.

Marylanders are happy when welcoming strangers to their State and entertaining them within the portals of their own homes. They are kind to profusion and spare no pains to please. It gives me pleasure to extend the right hand of fellowship to you gentlemen who are the managers and directors of those "houses of grace" which, through your skill and kindness, help to make life bearable to those suffering from the darkness of affliction. Since 1844 this Association has met at stated times, bringing together in convention men from all parts of this country to exchange thoughts and to learn what has been done to lighten the burdens of human suffering and to extend human happiness.

The time was when lunacy was considered a special manifestation of Divine wrath and the victim was banished from friends, deprived of sympathy and, in the charge of inhuman keepers, dragged out a miserable existence. He was looked upon as a wild beast and the treatment received often reduced him to that state. At the beginning of this century there were, in this country, but three institutions for the care of the insane. In 1750 Franklin advocated the establishment of such an institution in Pennsylvania and that is the oldest in the United States. Within its walls the insane were installed and treated by kindness instead of by chains and solitary punishment. I believe in 1769 Virginia passed an act establishing an institution that was opened in 1773. The institution first mentioned was not exclusively for the insane. Maryland inaugurated a

similar movement in 1774, but did not carry her intention into practical effect until 1797, when an institution was established on Broadway, known as the Maryland Hospital, where you gentlemen met in 1876 and were entertained by the Medical Faculty of this State.

When Franklin spoke for humane treatment in 1750, and Pinel broke the chains from the insane in Paris in 1792, and Tuke advocated non-restraint in England in the same year, and Rush of Philadelphia showed that insanity was not a curse but a disease, and that buildings especially devised for them could be built and that physicians especially skilled should have charge of such institutions, a new era opened up for the insane. The most practical good, however, came through the efforts of that perfect and noble woman, Dorothea L. Dix, who, without fortune and in bad health, depending solely upon her own will and the good of her cause, visited every asylum in the United States and almost every prison to investigate the treatment of the inmates. No one has ever undertaken such a task before or since. Her observations were reported to the different State Legislatures of this country and every one gave the relief for which she petitioned. It was through her efforts that in 1852 the Maryland Legislature built what is known as the Maryland Hospital for the Insane, at Catonsville. The memory of her good deeds will outlast all those buildings, which must crumble and decay. You remember the work of Ray of Rhode Island, Gundry of Maryland, and Gray of Utica; you recall the gentleness and devotion of Mrs. Ballington Booth and of Mrs. Morse of Massachusetts, whose ancestors came from Maryland. In Baltimore we have the examples of Johns Hopkins, Moses Sheppard and Enoch Pratt. Sheppard's bequest was the largest amount ever left in the United States to a hospital for the insane. Through his beneficence the Sheppard Asylum was built. It is beautifully located within a few minutes' ride from the city, and during its three years of active operation it has done much to alleviate the anxieties of the friends of those who are afflicted with insanity. Enoch Pratt made the Sheppard Asylum his residuary legatee and, if his legacy is accepted by the trustees, it will probably be the largest sum of money ever yet contributed for the care of the insane.

I again welcome you, gentlemen, to this State and hope that your stay may be pleasant and agreeable. To you are entrusted the lives and happiness of many people.

"The sweetest blessings falling from Above
Are human sympathy and human love."

One strengthens hope by stimulating cheer—the other softens sorrow with its tears, and together they form the golden rim that spans the borders of eternity.

DR. ROHÉ:—The Association meets in this hall by the courtesy of the Medical and Chirurgical Faculty of Maryland, and I have

now the honor of introducing to you the President of that Faculty, Dr. C. M. Ellis.

DR. ELLIS spoke as follows:—

Gentlemen of the American Medico-Psychological Association:

It is a great pleasure that the first function falling to me in the discharge of my duties as President of the State Faculty, is to give you a hearty welcome to our new home. It is yours to do with as you like, and to use as long as it pleases you. Nor is this broad welcome perfunctory, for it is a proud day for the profession of Maryland that we are in possession of a home, not only ample for all present needs of the profession of the city and State, but equal, we hope, to any demands our brethren outside of the State may make upon us. We hope that as our city of Baltimore grows in renown as a medical centre, as it surely will, it will become yearly more attractive to the National Associations, and that in the future we shall have many opportunities of extending to others the same cordial welcome we to-day so cheerfully give to you.

Your coming to Baltimore at this time is opportune to the general interests of the insane within our borders, for this with us is an era of renewed activity of agencies looking to the improvement of the condition of this class of unfortunates. The Sheppard Asylum, after nearly half a century of prudent preparation, has recently opened under most favorable auspices, and its judicious management has attracted to it the residuary estate of a distinguished citizen recently deceased—a princely sum. The State has within the past two years purchased Springfield, a magnificent property, and the Second Maryland Hospital for the Insane is, under liberal appropriations, rapidly developing there. Much has been done, much is doing, but unfortunately much remains to be done. Our almshouses and jails are still tenanted by the feeble-minded and distraught, and county asylums perpetuate their abominations without even justifying the poor excuse for their existence in lessened cost.

Some effort is being made to arouse the conscience of the State to its further duty towards those of the insane who are deprived of opportunity for betterment in the wards of well-equipped hospitals. This work should be assumed by the profession, and a committee of the Faculty has been appointed to formulate desired legislation and to advocate its enactment into law by our Legislature.

Our ultimate aim is the aim of all alienists and philanthropists the world over, namely, State care of the insane. Every insane man, woman or child, whatever his social condition, should, under a humane and enlightened government, be entitled to a certain minimum provision within the confines of hospitals or asylums, sustained by the State, for their cure or for their care.

I do not hesitate, as far as this State is concerned, to declare that this end can be attained as soon as the conscience of the medical profession of the State can be aroused and its plain duty in the premises is acknowl-

edged, for what the united profession of Maryland intelligently wants and persistently demands can always be obtained. This, then, is our concern, and it is the hope of those interested in this work that your deliberations will attract the attention of the medical men of the State, and assist us in arousing them to a just appreciation of their responsibility towards this otherwise defenseless and helpless class of our population.

There is a lesson that is trite to every doctor who thinks, that needs to be iterated and reiterated in the public ear until some impression is made upon the public mind, and that is that private care of the insane breeds poverty. I have myself seen so many families impoverished by the expense incurred in sustaining its insane members either at home or in public institutions, that the disastrous lesson made early a profound impression upon my mind. And my long familiarity with almshouse life illustrates this fact from another point of view, which is this, that a great number of the idiotic and incurably insane inmates of the county almshouses are descendants one, two or perhaps three generations removed, of former well-to-do, prosperous, indeed, influential parentage, who with their progeny, are either extinct or pauperized, where they do not survive as mental imbeciles. State care of the insane therefore commends itself to the medical profession, on which, in this State at least, its early attainment largely depends.

Again, gentlemen, in the name of the Medical and Chirurgical Faculty, I give you cordial greeting and welcome to our city and State.

PRESIDENT POWELL responded as follows:—

In behalf of this Association I very gratefully accept the cordial welcome so kindly tendered by His Excellency, the Governor of the great Commonwealth of Maryland, and Dr. Ellis, President of the Medical and Chirurgical Faculty. We are glad to find ourselves in Baltimore, and while we are profoundly grateful for your kindly greeting, it is nothing more than we had every reason to expect. You, sirs, are the representatives of a State and city famed all over the land for the elegance and breadth of its hospitality. We are, as you know, an international association, from ocean to ocean, from the Gulf of Mexico to Hudson's Bay. The institutions of which we have charge aim to minister to those mentally afflicted, and the work that we try to do appeals pathetically to all who have hearts to sympathize with suffering humanity; and we know that we find hearts responsive in your midst.

We are glad to be in a State and city famous during many years for the number and efficiency of its benevolent institutions. Look in whatever direction we may, we have before our eyes some magnificent building intended as a refuge for those in need. The Catholic, Protestant and Hebrew have vied with each other in providing shelter for the orphans, homes for the aged, homes for the friendless babes; the blind, the lame, the deaf, the dumb find provision for their needs, and here also large

hospitals designed as asylums for the insane open wide their portals to this class of the afflicted.

We are glad to be where a hospital endowed by a native of this city and bearing his name exists; a hospital that has no superior and perhaps not an equal in its equipment; a hospital with its doors open to the sick of every condition, and every race; and which provides all the relief the most advanced science can give. The moral grandeur and blessed results of such a hospital to science and suffering humanity can never be adequately estimated. All honor to the memory of Johns Hopkins and Dr. Richard Sprigg Steuart; the influence of such men never dies, but lives on forever to bless the world. We are glad to be in a State and city of magnificent libraries, where Peabody and Pratt, men from the North, left their monuments where they laid the foundation of their fortunes. We are glad to be where those noble benefactors of the insane, Moses Sheppard and Enoch Pratt lived. We are glad to be in a city where fair women, long famed for peerless beauty, have won higher fame by the boundlessness of their charities.

We know that your State is a grand one, and that your city is a fair one, and we should be glad to stand upon the surrounding hills to look upon the blue peaks of the distant Blue Ridge upon the one side, and to feast the eye upon the matchless beauty of the Chesapeake with its steamers and shipping on the other; to stand where the brave defenders drove back the invaders in 1812; to look with admiring gaze upon the monument erected to Washington, so noted for its grand beauty and symmetry; to wander under the grand old oaks of Druid Hill, and to walk in the flower bedecked paths of Patterson Park. But our mission is a serious one; we are here for labor, not for amusement, and may not be able to go where we would, but we assure you, sirs, that we none the less appreciate the privileges your kindness grants us. Now, in conclusion, allow me to say in all sincerity, and for all, we thank you cordially.

At the request of the President, Dr. W. W. Godding of Washington here took the chair.

Upon motion of Dr. Brush, the medical profession of Baltimore was unanimously invited to attend the sessions of the Association.

Upon motion of Dr. Charles G. Hill, the members of the Lunacy Commission of the State of Maryland and the secretary of the Commission, Dr. William Lee, were invited to attend the sessions of the Association and were accorded the privileges of the floor.

Dr. Wm. M. Edwards of Michigan introduced the Hon. A. J. Mills, of Kalamazoo, Michigan, a trustee of the Michigan Asylum for the Insane, who was also unanimously accorded the privileges of the floor.

A recess was then taken for the registration of members.

The following members were present during the whole or a portion of the sessions:

- Adams, Geo. S., M. D., Medical Superintendent Westborough Insane Hospital, Westborough, Mass.
- Allen, H. D., M. D., Milledgeville, Ga.
- Allison, Henry E., M. D., Medical Superintendent Matteawan State Hospital, Fishkill Landing, N. Y.
- Babcock, J. W., M. D., Medical Superintendent State Hospital for the Insane, Columbia, S. C.
- Babcock, Warren L., M. D., Assistant Physician St. Lawrence State Hospital, Ogdensburg, N. Y. (*Associate member.*)
- Bancroft, Charles P., M. D., Medical Superintendent New Hampshire Asylum for the Insane, Concord, N. H.
- Beemer, Nelson H., M. D., Superintendent Mimico Asylum for the Insane, Toronto, Ontario.
- Berkley, Henry J., M. D., Attending Physician City Insane Asylum, Baltimore, Md.
- Blackford, Benjamin, M. D., Medical Superintendent Western State Hospital, Staunton, Va.
- Blumer, G. Alder, M. D., Medical Superintendent Utica State Hospital, Utica, N. Y.
- Brush, Edward N., M. D., Physician-in-chief and Superintendent Shepard Asylum, Towson, Md.
- Burrell, Dwight R., M. D., Resident Physician Brigham Hall, Canandaigua, N. Y.
- Burgess, T. J. W., M. D., Medical Superintendent Protestant Hospital for the Insane, Montreal, P. Q.
- Burr, C. B., M. D., Oak Grove Hospital, Flint, Michigan.
- Chapin, John B., M. D., Physician and Superintendent Pennsylvania Hospital for the Insane, Philadelphia, Pa.
- Chase, Robert H., M. D., Medical Superintendent Friends' Asylum, Frankford, Pa.
- Clark, Daniel, M. D., Medical Superintendent Asylum for the Insane, Toronto, Ontario.
- Clarke, Charles K., M. D., Medical Superintendent Rockwood Hospital, Kingston, Ontario.
- Crumbacker, W. P., M. D., Medical Superintendent West Virginia Hospital for the Insane, Weston, W. Va.
- Curwen, John, M. D., Medical Superintendent State Hospital for the Insane, Warren, Penna.
- Dewey, Richard, M. D., Milwaukee Sanitarium, Wauwatosa, Wis.
- Dold, William E., M. D., Assistant Physician Bloomingdale Asylum, White Plains, N. Y. (*Associate member.*)
- Drewry, W. F., M. D., Medical Superintendent Central State Hospital, Petersburg, Va.

- Edwards, Wm. M., M. D., Medical Superintendent Michigan Asylum for the Insane, Kalamazoo, Michigan.
- Eyman, H. C., M. D., Medical Superintendent Cleveland State Hospital, Cleveland, Ohio.
- French, Edward, M. D., Superintendent Medfield Insane Asylum, Medfield, Mass.
- Gilman, H. A., M. D., Medical Superintendent Iowa Hospital for the Insane, Mt. Pleasant, Ia.
- Givens, A. J., M. D., Stamford Hall, Stamford, Conn.
- Godding, W. W., M. D., Medical Superintendent Government Hospital for the Insane, Washington, D. C.
- Gundry, Richard F., M. D., Richard Gundry Home, Catonsville, Md.
- Hancker, W. H., M. D., Medical Superintendent Delaware State Hospital, Farnhurst, Del.
- Harrington, Arthur H., M. D., Physician Asylum for Insane Criminals, Bridgewater, Mass.
- Heyman, Marcus B., M. D., Assistant Physician Manhattan State Hospital, Ward's Island, N. Y. (*Associate member.*)
- Hill, C. G., M. D., Attending Physician Mount Hope Retreat, Baltimore, Md.
- Hill, Gershom H., M. D., Medical Superintendent Iowa Hospital for the Insane, Independence, Ia.
- Hinckley, L. S., M. D., Medical Superintendent Essex County Hospital, Newark, N. J.
- Holmes, Chas. M., M. D., Assistant Physician Northampton Lunatic Hospital, Northampton, Mass. (*Associate member.*)
- Howard, Eugene H., M. D., Medical Superintendent Rochester State Hospital, Rochester, N. Y.
- Howard, Herbert B., M. D., Medical Superintendent Asylum for Chronic Insane, Tewksbury, Mass.
- Hoyt, Frank C., M. D., Medical Superintendent Iowa Hospital for the Insane, Clarinda, Iowa.
- Hurd, Arthur W., M. D., Superintendent Buffalo State Hospital, Buffalo, N. Y.
- Hurd, Henry M., M. D., Baltimore, Md.
- Kulp, John H., M. D., Superintendent Insane Department Mercy Hospital, Davenport, Ia.
- Long, Oscar R., M. D., Medical Superintendent Asylum for Dangerous and Criminal Insane, Ionia, Michigan.
- Lyon, Samuel B., M. D., Medical Superintendent Bloomingdale Asylum, White Plains, N. Y.
- Mabon, William, M. D., Superintendent St. Lawrence State Hospital, Ogdensburg, N. Y.
- Macdonald, A. E., M. D., General Superintendent Manhattan State Hospital, Ward's Island, New York.
- Macy, Wm. Austin, M. D., Superintendent Willard State Hospital, Willard, N. Y.

- Mead, Leonard C., M. D., Medical Superintendent South Dakota Hospital for the Insane, Yankton, S. D.
- Meredith, Hugh B., M. D., Medical Superintendent State Hospital for the Insane, Danville, Pa.
- Miller, John F., M. D., Medical Superintendent State Hospital, Goldsboro, N. C.
- Mills, Charles K., M. D., 1909 Chestnut Street, Philadelphia, Penna.
- Mitchell, Thomas J., M. D., Medical Superintendent Mississippi State Lunatic Asylum, Jackson, Miss.
- Mosher, J. Montgomery, M. D., 202 Lark St., Albany, N. Y.
- Moulton, A. R., M. D., Assistant Physician Pennsylvania Hospital for the Insane, Philadelphia, Penna.
- Murphy, J. B., M. D., Medical Superintendent Asylum for Insane, Brockville, Ontario.
- Murphy, P. L., M. D., Medical Superintendent State Hospital, Morganston, N. C.
- Neff, Irwin H., M. D., Assistant Physician Eastern Michigan Asylum, Pontiac, Michigan. (*Associate member.*)
- Norris, Milton D., M. D., Assistant Physician Second Hospital for the Insane, Sykesville, Md.
- Orth, H. L., M. D., Medical Superintendent Pennsylvania State Lunatic Hospital, Harrisburg, Penna.
- Page, Charles W., M. D., Medical Superintendent Danvers Lunatic Hospital, Danvers, Mass.
- Park, John G., M. D., Groton, Mass.
- Parsons, Ralph L., M. D., Greenmount, near Sing Sing, New York.
- Pilgrim, Charles W., M. D., Medical Superintendent Hudson River State Hospital, Poughkeepsie, N. Y.
- Powell, Theophilus O., M. D., Medical Superintendent State Lunatic Asylum, Milledgeville, Ga.
- Preston, R. J., M. D., Medical Superintendent Southwestern State Hospital, Marion, Va.
- Ratliff, J. M., M. D., Superintendent Dayton State Hospital, Dayton, O.
- Reynolds, Thomas W., M. D., Assistant Physician Asylum for Insane, Hamilton, Ontario. (*Associate member.*)
- Richardson, A. B., M. D., Medical Superintendent Columbus State Hospital, Columbus, Ohio.
- Roberts, Linnaeus A., M. D., Assistant Physician Boston Insane Hospital, Boston, Mass. (*Associate member.*)
- Robinson, J. F., M. D., Medical Superintendent Asylum No. 3, Nevada, Mo.
- Rogers, Joseph G., M. D., Medical Superintendent Northern Indiana Hospital for the Insane, Longcliff, Logansport, Ind.
- Rohé, George H., M. D., Medical Superintendent Second Hospital for the Insane, Sykesville, Md.
- Row, W. D., M. D., Superintendent Second Hospital for the Insane, Spencer, W. Va.

- Sachs, B., M. D., 21 East 65th Street, New York City.
Sanborn, Bigelow T., M. D., Medical Superintendent Maine Insane Hospital, Augusta, Maine.
Scribner, Ernest V., M. D., Medical Superintendent Worcester Insane Asylum, Worcester, Mass.
Searcy, James T., M. D., Medical Superintendent Alabama Bryce Hospital, Tuscaloosa, Alabama.
Sefton, Frederick, M. D., The Pines, Auburn, N. Y.
Selling, L. M., M. D., Broadview, Holyoke, Mass. (*Associate member.*)
Taber, Susan J., M. D., Physician Department for Women State Hospital for the Insane, Norristown, Pa.
Tobey, Henry A., M. D., Medical Superintendent Toledo State Hospital, Toledo, Ohio.
Tuttle, George T., M. D., Assistant Physician McLean Hospital, Waverley, Mass. (*Associate member.*)
Wade, J. Percy, M. D., Medical Superintendent Maryland Hospital for the Insane, Catonsville, Md.
Wagner, Charles G., M. D., Medical Superintendent Binghamton State Hospital, Binghamton, N. Y.
White, M. J., M. D., Medical Superintendent Milwaukee Hospital for the Insane, Wauwatosa, Wis.
Wise, P. M., M. D., President State Commission in Lunacy, Albany, N. Y.
Woodbury, Charles E., M. D., Inspector of Institutions State Board of Lunacy and Charity, Boston, Mass.
Woodson, C. R., M. D., Medical Superintendent State Lunatic Asylum No. 2, St. Joseph, Mo.
Worcester, William L., M. D., Pathologist Danvers Lunatic Hospital, Danvers, Mass.

Also as guests of the Association—

- Dr. Conway of Staunton, Va.
H. A. Reeves, Commissioner in Lunacy, Albany, N. Y.
Louis W. Hall, President Board of Trustees Pennsylvania State Lunatic Hospital, Harrisburg, Pa.
A. J. Mills, President Board of Trustees Michigan Asylum for the Insane, Kalamazoo, Michigan.
E. C. Reid, Member Board of Trustees Michigan Asylum for Dangerous and Criminal Insane, Ionia, Michigan.
Dr. A. T. McDonald of Iowa.

The President appointed Drs. A. B. Richardson, of Ohio; C. K. Clarke, of Ontario; W. F. Drewry, of Virginia, as Committee to nominate officers of the Association for the ensuing year.

The address of the President, "A Sketch of Psychiatry in the Southern States," was then read.

Upon motion of Dr. Blackford, of Virginia, seconded by Dr.

Blumer of New York, the thanks of the Association were tendered Dr. Powell for his exceedingly interesting and instructive address, and a copy was requested for publication.

The Secretary presented his financial statement (see Transactions) which was referred to the Auditors.

Adjourned.

SECOND SESSION.

The Association was called to order by the President at 3 o'clock, p. m.

The following papers were read: "General Questions of Auto-Infection," Dr. Chas. K. Clarke, Kingston, Ontario; "The Rôle of Auto-Infection in Melancholia and Epilepsy," Dr. Charles G. Hill, Baltimore, Md., and "Clinical Aspects of Auto-Intoxication," Dr. Arthur W. Hurd, Buffalo, N. Y., which were discussed by Dr. Van Gieson of the Pathological Institute of the New York State Hospitals.

A "Demonstration of Various Types of Changes in the Giant Cells of the Paracentral Lobule" was then given by Dr. Adolf Meyer, Worcester, Mass.

Adjourned.

THIRD SESSION.

The Association was called to order by the President at 8 p. m.

The following papers were read: "The Development of the Higher Brain Centres," Dr. Stewart Paton, Baltimore, Md.; "The Genesis of a Delusion," Dr. A. B. Richardson, Columbus, Ohio; "The Psychology of Insane Delusions," Dr. W. L. Worcester, North Danvers, Mass., which were discussed by Drs. Hurd, Brush, Burr and Worcester.

Also the following: "Arterial Sclerosis, Aneurism and Multiple Softening in Progressive Dementia," Dr. Charles K. Mills and Dr. Mary A. Schively, Philadelphia, Pa., which was discussed by Drs. Berkley and Meyer.

Adjourned.

WEDNESDAY, MAY 12, 1897.

FIRST SESSION.

The meeting was called to order by the President at 10 a. m.

The Secretary reported that the Council had recommended the following applications for membership:

FOR HONORARY MEMBERSHIP.

Dr. René Semelaigne.....Paris, France.

FOR ACTIVE MEMBERSHIP.

Dr. Nelson H. Beemer..... Mimico, Ontario.
Dr. Oliver M. Dewing..... Kings Park, N. Y.
Dr. Robert M. Elliott.....Brooklyn, N. Y.
Dr. Edward French..... Medfield, Mass.
Dr. J. L. Hildreth..... Cambridge, Mass.
Dr. Edward B. Lane..... Boston, Mass.
Dr. William B. Lyman.....Mendota, Wis.
Dr. A. E. Macdonald..... Ward's Island, N. Y.
Dr. William A. Macy..... Willard, N. Y.
Dr. Hugh F. McNary..... Lakeland, Ky.
Dr. John B. Murphy.....Brockville, Ont.
Dr. Hartstein W. Page..... Worcester, Mass.
Dr. W. F. Scott..... Lexington, Ky.
Dr. J. Percy Wade..... Catonsville, Md.
Dr. J. L. Warden.....Pleasant Hill, Mo.
Dr. Wm. L. Worcester.....Danvers, Mass.

FOR ASSOCIATE MEMBERSHIP.

Dr. Warren L. Babcock..... Ogdensburg, N. Y.
Dr. Geo. S. Bidwell..... Waterbury, Vt.
Dr. George Boody..... Independence, Ia.
Dr. Charles M. Franklin.....Towson, Md.
Dr. Frederick L. Hills..... Concord, N. H.
Dr. Richard H. Hutchings.....Ogdensburg, N. Y.
Dr. William E. Lightle..... New Hampshire.
Dr. R. H. Moffitt.....Mt. Pleasant, Iowa.
Dr. Harold L. Palmer..... Utica, N. Y.
Dr. Caroline L. Pease..... Ogdensburg, N. Y.
Dr. J. N. Teeter..... Utica, N. Y.

On motion of Dr. Gilman, the Secretary was instructed to cast the ballot of the Association for their election and they were all declared elected.

Dr. Chapin, in offering resolutions urging an improvement in the medical service of prisons, reformatories and penitentiaries in order to promote the study of criminology, spoke as follows:

It has probably happened to many of the members of this Association to be called to examine persons charged with crime, as well as those who have been convicted of crime, and to make a report upon their mental condition, or to appear in court for the purpose of giving expert testimony at a trial. Referring to my own experience, while I have never sought this service, and have reluctantly accepted it when it has been performed, I may state that in the performance of this duty I have visited nine prisons and jails in several States—some of them on several different occasions. In every case there was an issue involving human life. Although I have made diligent inquiry of the physicians of these institutions about the medical history of the criminals and convicts examined, the attempt to secure this has been, as a rule, unsatisfactory and usually attended with absolutely negative results. I have always asked for access to medical records or histories that might be a material aid in arriving at a decision, but have never been able to ascertain that any such case-notes were made or required by the regulations of the prisons or jails. If the experience of others is similar to mine in such cases, the physician and expert must then expect to enter upon his examination of these cases wholly unaided by observations which should be impartially made and recorded, and to form his conclusions unaided by any facts and information he has a reasonable right to have in his possession. It is sometimes too evident that the medical officer of these institutions is an unwilling witness; is without experience in the observation of the insane; or, what is painful to observe, that he is intimidated, or without such legal recognition in the discharge of his duties that he can perform them with proper professional independence and dignity.

Perhaps others having had a similar experience have reached the same conclusions at which I have arrived. If such is the case, it is proper that we give expression to our views, and upon the larger relations which we think physicians of prisons and jails ought at this day to hold to these institutions, and to penology.

This Association has on former occasions expressed its opinion in plain language on the separate care of the criminal and convict insane. It may again re-affirm its convictions, if it shall be deemed advisable, that the hospital for the insane is the most appropriate place for the care and treatment of the criminal and convict insane. It may go further, and in the interests of the welfare of the criminal and convict insane, for medico-legal purposes and to promote the scientific study of penology, properly urge that the standard of medical service in the penitentiaries and prisons of the country be elevated. We do not claim an unquestionable right to arraign the medical officers of these institutions, but there is a sentiment that their duties and prerogatives might be enlarged, that they should have them more clearly defined by laws or prison regulations, and that they be protected in the independent and conscientious discharge of their functions. We have an unquestionable right to demand that the interests of the insane in prisons, as elsewhere, shall be guarded if they are to remain under prison rules, if such practice is anywhere tolerated. We

have a moral and professional right to demand that the medical status of the convict shall be determined by physicians and not by managers, governors of prisons and wardens assuming to act as experts.

The following resolution is submitted for your consideration:

Resolved, "That it is the sense of this Association that the medical service of all penitentiaries and prisons is of sufficient importance to justify for its proper performance the selection of well-educated physicians of mature judgment, who, in addition to their fitness for the general practice of their profession have some knowledge of insanity and familiarity with the insane; that the duties of a physician to a prison be so clearly defined by law that they may be performed without hindrance or intimidation; that he shall be permitted and required on the reception of a prisoner to make an entry of his mental and physical condition, and from time to time to make such additional records of all facts and changes as they may appear from his personal examination; and that these case-records, together with special reports, at stated periods, be submitted to the warden, superintendent, inspectors or managers of the prisons, and be open to examination on the order of a designated authority."

Resolved, "That legislation be invoked, where practicable, and the co-operation of all prison managers and medical officers of prisons be urged to the collection of facts that will lead to a better understanding of the relation of insanity, and mental and physical degeneration, to crime and vice."

Resolved, "That a committee of three be appointed by the president, to which shall be referred the foregoing resolutions with the request that they make a report at the next annual meeting of this Association."

On motion, the resolutions were adopted and referred to the following committee:

Dr. J. B. Chapin, Philadelphia; Dr. Henry E. Allison, Fishkill Landing, N. Y.; Dr. Charles K. Clarke, Kingston, Ont.

Dr. A. B. Richardson for the nominating committee reported the selection of the following officers for the ensuing year:

For President, Dr. R. M. Bucke, London, Ont.

For Vice-President, Dr. Henry M. Hurd, Baltimore, Md.

For Secretary and Treasurer, Dr. C. B. Burr, Flint, Mich.

For Auditors, Dr. P. L. Murphy, Morganton, N. C., and Dr. S. B. Lyon, White Plains, N. Y.

For Members of Council for three years, Dr. J. T. Searcy, Tuscaloosa, Ala.; Dr. T. J. W. Burgess, Montreal, Canada; Dr. F. C. Hoyt, Clarinda, Iowa, and Dr. H. C. Eyman, Cleveland, Ohio.

Dr. Richardson announced that the change in the Secretary and Treasurership was made because Dr. Hurd had expressed himself as being unwilling to continue that work longer; and said

that the committee regretted exceedingly the loss of his valuable services.

The Secretary was instructed by vote of the Society to cast the ballot in favor of all the officers named.

Dr. F. C. Hoyt reported for the Auditors that the accounts of the Treasurer of the American Medico-Psychological Association and the accounts of the Managing Editor of the American Journal of Insanity had been examined and found correct in every particular.

Upon motion of Dr. Gilman, the report was accepted.

THE AMERICAN JOURNAL OF INSANITY.

DR. DEWEY. I would like to make a statement in regard to the American Journal of Insanity. The members are aware that the Journal was purchased from the State Hospital at Utica three years ago and that the committee appointed for its management requested me to take charge of it and to edit it at Chicago, which I have done during the three years. The Journal has during that time been laboring under disadvantages, especially in the fact that its managing editor was exceedingly pressed with other duties and could not give it the time and attention he desired, and also that the times have been unfavorable to a large income from advertising. It is, perhaps, a question whether the Journal ought to look to advertising for its income, but it has necessarily done so thus far, and if it is to continue to do so its advertising should be placed on some business-like basis. It is impossible for the editor to do the soliciting of advertisements, at least it is out of his line, although both Dr. Blumer, my predecessor, and myself did a great deal of work in that line.

In connection with the advertising in the Journal, I should say to the members that I think consideration ought to be given in making purchases to those persons in business of different sorts who advertise with the Journal, in the placing of your orders. I think those who advertise with the Journal should be given preference in your purchases, other things being equal.

The Journal started without any money in the treasury, but ended the first year with a balance of \$98.00. In the second year the income, together with this balance on hand, was \$2,086.22 and the disbursements were \$1904.11, leaving a balance of \$182.11. In the third year the receipts were \$2215.83 and the disbursements \$2190.41, leaving at the present time \$207.53 in the treasury.

There is now due from advertisers \$280.00, all of which, except perhaps \$25.00, is good. The further income from subscriptions now due and most of which is good should be \$325.00.

Upon motion of Dr. Blackford, a vote of thanks was tendered to Dr. Hurd for the conscientious manner in which he has dis-

charged the duties of Secretary and Treasurer for the past five years.

AMENDMENTS TO THE CONSTITUTION AND BY-LAWS.

The Secretary passed about slips containing the proposed amendments to the Constitution and By-Laws which were then considered.

The first amendment, proposed by Dr. Wise, was adopted. It is as follows: To insert in Article V, previous to the sentence beginning "The only persons eligible for associate membership," the following: "Physicians who are especially interested in the treatment and welfare of the insane are eligible to active membership."

The second amendment, proposed by Dr. Woodson: To strike out after the word "by" in line four of Article VIII, the words, "a Committee appointed for that purpose by the President," and insert in lieu thereof the words "the Council," was then taken up.

Dr. Brush called for the reading of the articles to which amendments were proposed.

Dr. A. B. Richardson opposed the amendment on the ground that it would give the Council the power to perpetuate itself and it might at some time become a close corporation.

Dr. J. B. Chapin also opposed the amendment, stating that the present Constitution had been adopted after very careful consideration and had served the Association perfectly.

Dr. Woodson defended the amendment, stating that the Council could not perpetuate itself and that the Constitution was not all that was needed.

Dr. Long supported Dr. Woodson's view because he thought it would result in always selecting the best men obtainable for officers.

Dr. Blackford was opposed to any change which would take away the powers of the President.

Dr. H. A. Gilman also opposed the amendment and stated that in looking back he could see no reason for the Association to be ashamed of any of the officers that had been selected by the present methods.

A vote was then taken and the amendment was lost.

A reconsideration of the vote on the amendment offered by Dr. Wise was then moved.

After a full discussion by Drs. Chapin, Wise, Brush, Woodson and Long the motion to reconsider prevailed.

Dr. G. A. Blumer offered an amendment to the amendment proposed by Dr. Wise, as follows: "Physicians who by their professional work or published writings have shown a special interest in the care and welfare of the insane, are eligible to active membership," which was not accepted.

Dr. A. B. Richardson moved to lay the matter on the table until the next annual meeting.

Dr. Wise believed that this was out of order and that the Constitution required a proposed amendment to be disposed of. The Chair ruled that the motion to lay on the table was out of order.

The vote being taken, the amendment was lost.

The following amendment, proposed to Article III of the By-Laws by Dr. Woodson: "No paper except the President's address, shall exceed twenty minutes in length, nor discussion five minutes, and no one shall be heard a second time," was then considered and lost.

Dr. Blumer then gave notice of the following amendment: "Insert before the words, 'The only persons eligible' in Article V, the following 'Physicians, who by their professional work or published writings have shown a special interest in the care and welfare of the insane are eligible to active membership'," which will lie over for one year under the rules.

Dr. Blackford introduced to the Association Dr. Conway of Staunton, Va.

Dr. Wise introduced Hon. H. A. Reeves of Albany, a member of the N. Y. Commission in Lunacy.

Dr. Hill introduced Dr. A. T. McDonald.

A paper, "Some Observations on the use of Hyoscine," by Dr. Frank C. Hoyt, Clarinda, Iowa, was then read and discussed by Drs. Gilman, Brush, Godding, Woodson and Daniel Clark.

The following papers were then read: "Report of Cases, with Remarks," Dr. R. J. Preston, Marion, Va.; "Hospital Records," Dr. R. L. Parsons, Greenmount, N. Y.; "Medical and Material Aspects of Industrial Employment for the Insane," Dr. G. A. Blumer, Utica, N. Y.

The meeting then adjourned to permit the members to attend the centennial celebration of the Maryland Hospital for the Insane at Catonsville, Maryland.

SECOND SESSION.

The meeting was called to order at 8 p. m. by the President, Dr. T. O. Powell.

The annual address on "Advances in Neurology and their Relations to Psychiatry" was delivered by Dr. B. Sachs, of New York.

Upon motion, the thanks of the Medico-Psychological Association were tendered to Dr. Sachs for his able and profitable address. Adjourned.

THURSDAY, MAY 13, 1897.

FIRST SESSION.

The meeting was called to order at 10.10 a. m. by the President, Dr. T. O. Powell.

The following report of the action of the Council was presented by the Secretary:

1. That Dr. M. D. Norris, of Sykesville, Md., be recommended for active membership, and Dr. Madeline Folkland for associate membership.

2. That St. Louis, Mo., be selected as the place for the next meeting of the Association, and that the second Tuesday in May be fixed upon as the date of that meeting.

3. That the following members of the Association be selected as an Editorial Staff of the American Journal of Insanity: Dr. Henry M. Hurd, of the Johns Hopkins Hospital, Baltimore; Dr. G. Alder Blumer, of the Utica State Hospital, Utica, N. Y.; Dr. E. N. Brush, of the Sheppard Asylum, Baltimore, Md., and Dr. J. M. Mosher, of Albany, N. Y., formerly of the St. Lawrence State Hospital, Ogdensburg, N. Y.

4. That the Editorial Committee be empowered to use \$200 of the funds of the Association to assist in the publication of the American Journal of Insanity, should such expenditure be required.

The sections of this report were considered seriatim and were all adopted.

The following papers were read: "Report of a Case," Dr. R. G. Wallace, New York, which was discussed by Drs. Daniel Clark and Meyer; "Insanity following Surgical Operations,"

Dr. Richard Dewey, Wauwatosa, Wis., which was discussed by Drs. Richardson, Henry M. Hurd, Worcester and Rohé; "An Unusual Case of Meningitis," Dr. C. B. Burr, Flint, Michigan, which was discussed by Drs. Henry M. Hurd, Dewey, Woodson and Richardson.

DR. H. M. HURD:—As Dr. Stedman is absent and his paper cannot be read, I would suggest that Dr. Dewey be asked to make some remarks upon the After Care of the Insane.

DR. RICHARD DEWEY. The subject is one which I suppose every member of this Association, certainly all those who have had the responsibility of sending patients out into the world when they were wholly, or in some cases partly recovered, has felt to be a difficult one. This is particularly so where the patients starting again in life were indigent, perhaps without friends and home, as so many of those are who come to the public institutions for the insane. As a consequence of this many patients relapse, as we know, and return again to the institution. Their habits are perhaps such that their insanity is again caused by excesses in alcohol or other vicious practices. Or the patient, in a condition of destitution and unable to obtain work and without food and proper care, soon relapses. A large number, perhaps twenty-five per cent, who relapse and return to the institution would not relapse, or at least not so soon, and probably might have years of usefulness before them if they had some assistance. They ought to be sure of food and shelter for a limited time and of a physician to look after them.

We know that a large amount of work has been done in making it possible for discharged prisoners to get started in an honest way of life, because they encounter so great a prejudice. I believe there is just as much, if not more difficulty for an insane individual to get back into some useful avocation. These facts have led to efforts for the after-care of the insane both in France and in England, but no systematic effort in this direction has been made in the United States. A society in Paris provides buildings and employment for forty patients and there are always about forty individuals in that institution who have been discharged from the public insane asylums. None can remain longer than two or three months, but during that time they practice or are taught in the shop certain simple kinds of work. This work of the "Société de Patronage" for the insane, as it is called, has been found to be so beneficent that it has been approved by the Government, whose representatives have recommended appropriations to supplement it. In England there is also a house for the care and aid of recovered patients. In this country nothing has been done except in a desultory way. I remember that when I had a large number of patients to be discharged from an institution, I often had to do much work in endeavoring to find friends for them. Oftentimes the worst opponents of those patients are their own families

or friends. Those of limited intelligence and good-will often oppose very positively the return home of a relative of their own. They believe the condition to have been a hopeless one and wish the individual to stay the rest of his life in the hospital.

As I take it, what needs to be done at present is to bring this subject to the attention of those who have little knowledge of it. One of the best ways to do this I think would be to present the subject at the National Conference of Charities. This large and influential body from every part of our country meets this year in Toronto, and I desire to lay before the Association the suggestion that from the membership of this Association a committee be appointed with instructions to be present at the Toronto meeting in July to bring this matter before this Conference of Charities. Before leaving Chicago I had a letter from Miss Jane Addams, of Hull House, in which she said that she would take great pleasure in helping this movement along and would speak for it at Toronto. Her help would be of great value. I will write out a resolution to cover the question.

DR. H. M. HURD. I would state that Dr. Stedman is chairman of a similar committee on the part of the American Neurological Society. There should be no division of interest in this matter. We should appoint a committee to co-operate with the committee of the Neurological Society to bring this before the Conference of Charities or any other body competent to consider it.

DR. DEWEY. I will gladly accept the suggestion and offer the following:

Resolved, That it is the sense of the American Medico-Psychological Association that the after-care of the insane is worthy of earnest endeavor and that the Association requests the President to appoint a committee to co-operate with a like committee of the American Neurological Association in the furtherance of this object, and specially asks this committee to present the subject at the National Conference of Charities at its meeting in Toronto the present year.

DR. G. H. HILL. I think this is a very important question for us to consider. It is as practical as anything presented to us, for it looks to the future welfare of patients discharged from hospitals and to an extent prevents their having to return. The more generous the provision made by a State for the care of insane the more insane there are to be cared for. There is no difficulty in filling institutions provided by the State. Likewise the more kindly and skilfully the patients are treated the more tendency there is on the part of relatives to send their friends to the hospital early; but more than this is true, the better the patients are cared for and the more entertainment they have, the more reluctant they are to leave the hospital. It is often said by visitors that these people have better beds than they have at home, better bread than they can make at home and (I live in an agricultural State) the farmers do more dancing at the hospital than they do at home. Now, I think one way of providing for after-care is to hold the physician responsible for the after-treatment of

the insane individual whom he sends to the hospital. We have a commission in insanity appointed by the Governor which remains a long time in office. The officers of hospitals I think should give these commissioners, and physicians sending patients to the hospital, notice that it is their duty to look after a patient when he is discharged. We could notify them that the patient is about to be sent out and the commissioners should ask those who live near him, as a matter of charity and Christian duty, to assist him in getting employment and in making him welcome and contented at home.

DR. W. W. GODDING. It seems to me we have here a practical question second in importance to none that has been brought before us. While I sympathize fully with Dr. Hill in his statements and have heard the remarks of those friends who say, "it is so pleasant that I would like to stop here myself," I know the utter hollowness of such statements. I think none of us would wish to exchange brains with our unfortunate friends. It seems to me here is an opportunity for our Boards of Charity to take up a practical work. We know the work that has been done to lead thieves, burglars and so forth into honest life and we also know the blight that passes over a man with insanity. Here within two months I had a letter from a man who had taken a girl into his family for service, which stated that she was a most excellent girl, but he had just learned that she had once been in an institution for the insane, and if this were true he did not wish to risk the life of his children with her. These poor people going out without friends are certain to fall by the wayside and to return again to the sumptuous hospital unless we find some way to give them encouragement until the time when we can reasonably say that they are safe. I will gladly co-operate with anybody that will help this matter along. I do not mean by this that I want to be appointed on the committee, for I expect to be otherwise engaged at that time, in attendance upon the British Medical Association, but I hope this will be taken up and acted upon by the Conference of Charities at that time.

DR. H. A. GILMAN. It seems to me that this question in all its importance leads along the lines of Dr. Blumer's paper of yesterday in the matter of employment for patients in our hospitals. The limited experience we have had in our hospital in the matter of industrial employment has convinced us that much can be done to aid a patient who is convalescent to become self-supporting without much care after leaving the institution. We have, in a small way, started shops in our institution for the making of boots, shoes, brooms, brushes and tinware, and we have found an eagerness to do this work on the part of the patients that we did not even anticipate. We have with us patients who have within the past year learned the art of making shoes, of making good tinware, quite as good and perhaps better than we buy at extortionate prices, and brooms and brushes which cannot be excelled. Each patient can learn at least one of these useful employments and can be prepared to make a living for himself, and it seems to me that if this is done a great point has been gained towards preparing him for self-support after leaving the hospital.

They are fortified at least in one direction and some of them in several lines of employment and may become sufficiently skilled to command a good position in any shop. I was very much interested in Dr. Blumer's paper yesterday. I believe it ought to give us a greater impetus to work in this direction. I hope we shall hear from Dr. Hoyt on this subject, as he is doing perhaps as good work as any other man in this country, and has had a very extended experience in this direction.

DR. HOYT. This subject is indeed an interesting one, for both the questions of work for the insane while in hospitals and the care of the insane after leaving the institution are of great importance. I am inclined to think, however, that the question of provision for the care and treatment of the patient after leaving the hospital is more important to those who have charge of institutions adjacent to large cities than to those of us who derive our patients almost exclusively from the agricultural districts. I have had very little trouble in properly locating my patients, when they are to be discharged. Occasionally, however, I have been compelled to retain patients for a month or more until I could find some one who would give them homes and employment. I can readily see how vexed a problem this becomes in large cities, where under the most favorable circumstances many thousands are made to eke out a miserable existence and only the shadow of a livelihood is obtained. In such places, and under such untoward circumstances, the recently discharged patient is at a double disadvantage, on account of the feeling of fear which many people have about employing persons who have been insane, or are more or less defective mentally. I think the greater portion of our patients who are discharged as recovered should be discharged as "recovered with mental defect." Indeed, it is very questionable whether we have any considerable proportion of true recoveries.

We had in the State of Iowa a French community, formed by a better class of the peasantry about the time of the Franco-Prussian war. They were non-belligerent and socialistic in tendencies. They came to this country and formed a socialistic community, in which the individuality of the members was destroyed and the management of the affairs of the community vested in a committee. Some years ago the community dissolved and members were thrown upon the world to take care of themselves. These men were unusually well-educated and of more than average ability and yet the dissolution of the community was the cause of several cases of insanity which came under my observation. I have one now under my care and I often wish that I could write with the ease that he does. This patient gets well in a few weeks and I have sent him home frequently, but he comes again within a few weeks suffering from profound melancholia. He states that when he leaves the institution and its protecting care and is confronted with the problem of taking up with the world a battle for bread, he gives up and would rather die. It is this sense of solitude, this fear of the world, which overwhelms many of our patients and drives them to our doors again, begging for protection.

Industrial treatment is to me the most important method of treatment

now in use. It is not new, as indeed there is very little new, in the care of the insane. Some months ago I obtained from Dr. Blumer a complete set of the Transactions of this Association, and I have profited much by the experience and lessons of the old masters in our speciality. In reading back to a period before I was born, I was astonished to find that the drilling of patients in military maneuvers and the employment of the insane were practiced then. To the younger men in our Association, however, belongs the credit of reviving many of these methods, and of bringing them to a much higher degree of utility. Industrial pursuits of the proper kind prescribed for the patient, with the same care and thought as are drugs, are potent remedies. Work prevents introspection, drives away melancholy, substitutes a healthy mental process for a morbid one, and so keeps the patient from indulging in his delusions or other pernicious habits. At our institution we employ the greater proportion of our patients and find that it not only hastens restoration, but where this result is impossible, makes the patient more tractable, neater and much happier. As to its value from an economical view I will not speak, for this consideration should not concern us. I feel it a duty as imperative to furnish employment for my patients as I do to buy them drugs.

The resolution was unanimously adopted.
Adjourned.

SECOND SESSION.

The meeting was called to order at three o'clock by the President, Dr. T. O. Powell.

The Council recommended the election of Dr. William Searl, of South Dakota Hospital at Yankton, an associate member, to active membership.

The report was accepted and the Secretary instructed by motion to cast the ballot of the Association for Dr. Searl.

The Secretary announced that the ballot had been cast.

The following papers were presented: "Katatonia" (read by title), Dr. Frederick Peterson, New York, and Dr. C. H. Langdon, Poughkeepsie, N. Y.; "The Private Hospital for the Insane" (read by title), Dr. C. F. MacDonald, New York; "The After Care of the Insane" (read by title), Dr. Henry R. Stedman, Boston, Mass.; "Nursing in State Hospitals and Training of Nurses," Dr. Peter M. Wise, Albany, N. Y., which was discussed by Drs. H. M. Hurd, Tuttle, Eyman and A. W. Hurd; "Another Chapter in the History of the Jurisprudence of Insanity," Dr. Daniel Clark, Toronto, Ont., which was discussed by Drs. Godding and Allison, Hon. A. J. Mills and Dr. H. M. Hurd.

Adjourned.

FRIDAY, MAY 14, 1897.

FIRST SESSION.

The meeting was called to order by the President, Dr. T. O. Powell, at 10 o'clock.

The following paper was read: "The Constructive Forces," Dr. R. L. Parsons, Greenmount, N. Y.

The President requested Dr. John B. Chapin to take the chair.

DR. HOYT:—The Committee on the Hack Tuke Memorial Fund desires to make the following report:

The sum of \$170.50 was collected (a list of subscribers being herewith appended) and \$6.00 was expended for printing and postage. The balance—\$164.50 (£33 7s. 2d.) was sent to Dr. Henry Rayner of London, who acknowledged the receipt of same in the following letter:

2 Harley Street, W., 13 March, '97.

DEAR DOCTOR PILGRIM:—I am greatly indebted, as I am sure the Committee of the Hack Tuke Memorial will also be, to you for the trouble you have taken and the handsome addition you have made to the funds.

I regret that the total amount collected is so small that the Council are inclined to let it be employed in the upkeep of the library which Mrs. Tuke has handed over to the charge of the Medico-Psychological Association and to increase the same by purchase of books as far as may be.

From the views of Mrs. Tuke and from my knowledge of him and from his essentially literary turn, I do not think that a more fitting form of memorial could be found for him.

Again thanking you, believe me, with sincere regards,

Yours faithfully,

H. RAYNER.

D. HACK TUKE MEMORIAL FUND.

List of Subscribers.

C. W. Pilgrim	\$10.00
J. E. Courtney	5.00
T. E. Bamford	5.00
C. H. Langdon	5.00
I. G. Harris	5.00
Henry M. Hurd	5.00
Richard Dewey	10.00
Emma Putnam	5.00
H. L. Palmer	5.00
W. C. Gibson	5.00
J. N. Teeter	3.00

Geo. H. Torney	2.50
E. C. Gibney	2.00
C. W. Page	10.00
E. H. Howard	5.00
T. J. W. Burgess	5.00
Geo. H. Rohé	2.00
P. M. Wise	5.00
R. H. Hutchings	1.00
Frank G. Hyde	1.00
Walter M. Brinker	1.00
Sydney D. Wilgus	1.00
W. L. Babcock	1.00
W. G. Cooper	1.00
W. H. Kidder	1.00
C. K. Mills	5.00
R. L. Parsons	5.00
O. M. Dewing	3.00
H. P. Stearns	7.00
S. F. Mellen	5.00
Chas. G. Wagner	5.00
S. H. Talcott	10.00
C. C. Eastman	5.00
C. G. Hill	5.00
G. H. Hill	6.00
Frank C. Hoyt	5.00
H. A. Gilman	5.00
F. O. Jackman	1.00
F. T. Stevens	1.00
Madeline Folkland	1.00

\$170.50

Less Printing and Postage 6.00

\$164.50

Respectfully submitted,

CHAS. W. PILGRIM, Chairman.

FRANK C. HOYT,

CHAS. G. HILL.

On motion of Dr. Burr, the report was accepted, and the committee discharged.

The Chair announced the appointment of the following committee to co-operate with a committee of the American Neurological Association to promote the after-care of insane patients in accordance with the resolution of Dr. Dewey adopted

at a previous meeting, viz.: Dr. Richard Dewey, Wauwatosa, Wis.; Dr. G. A. Blumer, Utica, N. Y., and Dr. Daniel Clark, Toronto, Ont.

Dr. Geo. H. Rohé called attention to the efforts which had been made to secure a memorial to Dr. Benjamin Rush.

After discussion, upon motion of Dr. Dewey, a committee was appointed to bring the matter to the attention of the members of the Society.

The following paper was read: "Commitment of the Insane," Dr. Edward N. Brush, Towson, Md., which was discussed by Drs. Geo. H. Rohé, Wise and Lee. Also the following paper was read by title: "Local Myxedema in the Negro," Dr. H. J. Berkley, Baltimore, Md.

The following report of Committee was presented:

To the Medico-Psychological Association:

Your Committee to which was referred by the Council the pleasant duty of giving formal expression to the appreciation felt by all members of the American Medico-Psychological Association of the valuable labor of Dr. Richard Dewey, the retiring editor of the American Journal of Insanity, desires in this public manner to place upon permanent record its hearty thanks for the fidelity and ability with which he has discharged the varied and difficult duties of the position during the past three years. He has labored under many difficulties and has wrought out permanent results for the Association. It is most fortunate that the American Journal of Insanity has had his able direction and successful management at this formative period in its history. The Association regrets that Dr. Dewey finds it impossible to continue a connection with the Journal, which has proven so beneficial.

Your Committee would ask authority to procure at an expense not to exceed \$100, a fitting testimonial as a suitable material expression of gratitude to be publicly presented to Dr. Dewey at the next annual meeting of the Association.

T. O. POWELL,
J. B. CHAPIN,
HENRY M. HURD,

Committee.

On motion of Dr. Brush, the report was unanimously adopted.

DR. A. B. RICHARDSON:—I desire to offer the following:

Resolved, That the thanks of the Association are due and are heartily extended to the Committee of Arrangements for their untiring efforts for the entertainment of the members of the Association and the many courtesies that they have individually extended.

That the Association is indebted to the Medical and Chirurgical Faculty of Maryland for the use of their hall for the meetings of the Association.

That the Association desires hereby to record its appreciation of the generous and most enjoyable receptions and entertainments accorded by the Trustees and Officers of the Maryland Hospital for the Insane and of the Sheppard Asylum and of the Johns Hopkins Hospital and Mount Hope Retreat.

That the Association desires to express its thanks also to the members of the press for their courteous treatment and the complete reports made of the proceedings.

The resolutions were unanimously adopted.

The following report was received from the Committee on Statistical Tables:

Your Committee on Statistical Tables would respectfully report that but one or two suggestions in respect to the tables presented at a previous than in disapproval of the tables in their entirety. Under the circumstance have been received—these less in the line of suggestion, perhaps, stances the Committee assumes that the tables are reasonably acceptable to members of the Association.

The committee therefore asks that the Association give its endorsement to these tables and recommend them in the interests of uniformity to institutions publishing reports. It is not the intention of this report to place upon members any constraint to use the tables contrary to their judgment, but rather to invite the study of the tables and their tentative employment.

Very respectfully,

C. B. BURR,

HENRY M. HURD,

P. M. WISE,

Committee.

On motion of Dr. Edwards, the report was accepted and adopted.

Dr. Wise moved that Dr. A. E. Macdonald be the representative of this Association at the 12th International Medical Congress at Moscow and at the meeting of the British Medico-Psychological Association for 1897, which motion unanimously prevailed.

The Chair announced the appointment of the following as members of the Committee on the Rush Memorial:

Drs. Rohé of Maryland, Curwen of Pennsylvania, Searcy of Alabama, Burgess of Quebec, Blackford of Virginia, Richardson

of Ohio, Edwards of Michigan, Gilman of Iowa, Bancroft of New Hampshire, and Wise of New York.

THE PRESIDENT. I desire to thank the members of the Association for their kind forbearance in my many shortcomings in the office that you have given me, and thank you for the honor you have conferred upon me.

The Association then adjourned to meet in St. Louis, Mo., May 10, 1898.

C. B. BURR, *Secretary*.

GEORGE FIELDING BLANDFORD.

George Fielding Blandford, M. A. (Oxon.) 1854, M. D. 1867, F. R. C. P. Lecturer St. George's Hospital, London. Former President of the Medico-Psychological Association, President of the Psychological Section of the British Medical Association 1894, and Orator on Insanity at the International Medical Congress, Washington, U. S. A. Author of "Lectures on Insanity and its Treatment." Author of article on "Insanity" in Quain's Dictionary of Medicine. Author of "Prognosis of Insanity" in Tuke's Dictionary of Psychological Medicine. Lumleian Lecturer at the Royal College of Physicians "On Insanity," 1895. Contributor of the section on "Insanity" to the Twentieth Century Practice of Medicine.

Such is the bare outline of some of the records on the life track of Dr. Blandford.

He is distinctly the result of the careful culture of an originally bright stock.

Dr. Blandford was born in 1829 at Hindon in Wiltshire, being the son of a medical man. He was educated at Rugby, the public school forever associated with the great public school reformer, Arnold; a school which is proud of the many distinguished Englishmen it has produced. Rugby with its traditions of self-reliance and of trust in the honor of the boys, has special powers in developing the strongest virtues of the English race.

From Rugby Dr. Blandford became an Exhibitioner at Wadham College, Oxford, and he graduated in classical honors and became Master in Arts in 1854. In those days men completed their general and classical studies before they proceeded to Medicine, and we can not help regretting that the haste of the present day has curtailed the period devoted to general culture. In Dr. Blandford's case the culture not only left its impress but has provided him with lifelong interests which he still pursues as diversions from his professional work. Dr. Blandford was a student at St. George's Hospital, where he is now lecturer on Psychologi-

cal Medicine, and after taking his degree he studied at St. Luke's Hospital for the Insane in the city of London.

A commanding presence and kindly, considerate manners added to his professional knowledge, soon enabled him to follow his inclination to become a specialist physician in mental disorders.

He was long connected with two of the best private asylums near London, and was thus not only a busy consultant, but was able to watch disease in its various stages and phases.

A calm judgment and perfect honesty of purpose guided his conduct, and as a result he became as much the friend of his patients and their friends, as their trusted medical guide.

His relationships with his professional brethren are, and have been, most cordial and there is no one who is more trusted by his fellows than Dr. Blandford.

It is rather contrary to general English custom to criticise or praise a man fully during his lifetime, but in writing of Dr. Blandford one has less difficulty than with most men, for those who know him, know full well how little he has sought fame.

He is fond of art, and sketches admirably himself, so that his holidays always leave their permanent record in his sketch book.

Fond of domestic life and eminently companionable, Dr. Blandford's life is passed in pleasant places. He has for years all the professional success he desires, with abundant fresh material for additions to his standard and practical manual on insanity. Dr. Blandford having strong natural science tastes, has the liberal mind which accepts the changes which the advance of time demands. In thought and in practice he moves with the times.

He will be remembered by Americans with whom he mixed when at the Washington Congress, and he is always pleased when he meets his American friends in England.

He is one of the best specimens of the English physician, and he is widely cultivated and essentially helpful to the sick.

GEO. H. SAVAGE.

Abstracts and Extracts

NEUROTIC SYMPTOMS OF URICACIDAEMIA IN THE YOUNG.—David Drummond, M. A., M. D. (*Lancet*, May 15, 1897), calls attention to a special group of symptoms, chiefly nervous, affecting both sexes, particularly young persons, which would seem to depend upon uricacidaemia. His attention was called to the uric-acid factor in the case of a young person in whom the symptoms developed, in the opinion of his friends, in consequence of the consumption of an excessive quantity of butcher's meat. He was placed upon a milk diet and made a speedy recovery, but relapsed when he was allowed to consult his own tastes in the matter of food. Uric acid was found to be greatly in excess in this case and in others presenting similar symptoms. The symptoms were usually insidious in their origin and developed slowly, in some instances a trifling indisposition had rapidly developed into an alarming illness. Headache is common and its persistency and location in the frontal and vertical regions is characteristic. The appetite fails and there is constipation with other digestive disturbances, whilst anaemia and loss of flesh give the patient the appearance of illness. The temperature of the body is generally low; in one case during three weeks it did not reach normal. The pulse is irregular, sometimes rapid, often slow. The slow pulse is a striking feature and will serve to attract attention in a case that might be otherwise considered a simple dyspepsia. He has seen the pulse rate from 45 to 50 frequently. The tension is raised, though seldom very high. The hands and feet are generally cold and the fingers white. Sudden attacks of giddiness have occurred, which were difficult to distinguish from epileptiform seizures. The knee-jerk is lessened and may be absent and a peculiar sluggish habit of mind and body may be noticeable along with other characteristic traits foreign to the patient. In young women the menstrual functions may be often in abeyance for a long time. In several cases that have come under his observation the amount of uric acid excreted in twenty-four hours was from 13 to 25 grains, which is from two to three times the normal amount.

R. H. H.

MANIACAL CHOREA IN A MALE.—The *Lancet*, May 22, 1897, gives the particulars of an interesting case. Patient was a man, aged 21 years, who had shown the first symptoms of mental disorder about a fortnight before his admission to the asylum. He had gradually become dull from that time, and at the end of a week a well-marked condition of mental

stupor resulted. Four days later he emerged from this condition, becoming acutely maniacal, shouting, replying incoherently and presenting the usual tendencies to destructiveness and impulsiveness. On admission to the asylum there was no obvious sign of nervous disease and his bodily organs were found to be healthy. No tremor nor abnormal movement was observed and the reflexes were present. He could give no coherent account of himself and was dirty in his habits. For a month he remained acutely maniacal, but about the end of this time choreiform movements were visible in the hands and in the facial muscles. As these became gradually more marked, the mental symptoms became less distinct and obtrusive. There was no pyrexia and no evidence of cardiac disease was discovered. In the course of the next month the spasms became less marked and there was a fresh temporary outbreak of the maniacal symptoms which soon disappeared and his general condition rapidly improved so that in less than four months after his admission he was practically well. No cardiac complications developed. The writer points out that the interest of the case consists in the occurrence of the condition in a male adolescent, the precedence of the attack of typical chorea by mania, the absence of pyrexia, and the rapid recovery after the cessation of the movements.—DR. THOS. P. COWEN, *Journal of Mental Science*.

DOTARDS IN FRENCH ASYLUMS.—To avoid the crowding of the infirmaries attached to the lunatic asylums with cases of senile dementia, that is to say, with harmless lunatics who show no other sign of mental weakness than the feeble-mindedness common to the aged, the Prefect of the Seine has just invited the Assistance Publique to take measures to provide that only real lunatics shall be admitted into the asylums. The Prefect of Police has accordingly issued an important communication to all the police commissaries under him in which he requests them to give no heed to the applications made by hospital authorities for assistance in removing patients to a lunatic asylum except when the hospital authorities can state that they have definitely decided that the patient is actually insane. No one can be placed in a French asylum unless his mental state is such that he is a menace to public order or to other people. The Prefect requests his commissaries, every time that they are applied to by a hospital for a removal order, to demand the most explicit and accurate certificates from the medical men in charge of the patient. In cases where the certificates are not deemed sufficiently clear and full, the commissaries are to decide for themselves as to the state of the patient from the point of view of public safety and to make every inquiry necessary for this purpose.—Paris correspondent for the *Lancet*, May 22, 1897.

R. H. H.

FEMALE INEBRIETY.—An editorial in the *British Medical Journal* of April 17, 1897, presents some interesting statistics regarding this subject. The statistics were those presented at a meeting of the Society of

Public Medicine in Paris. Out of the 500 women who presented themselves for treatment at the externe department of the Laënnec Hospital, 156 showed undoubted signs of chronic alcoholism (31 per cent), while of the men, 70 per cent were similarly affected. Fifty-one per cent of the women, according to the statements of Dr. F. D. Grandmaison, were between 20 and 40 years of age, which he termed "the active period of existence." Five cases were below 20 and seven per cent over 60. Classified according to occupation, 118 female cooks attended, of whom 60 were inebriates, thus not belying their reputation. Out of the 27 laundresses, one-third or 9 per cent were alcoholics. Of the 70 charwomen, 48 per cent or 34 were drunkards. Of the 9 costermongers, all were chronic alcoholics. Of the 72 seamstresses, 8 per cent or 9 were excessive drinkers. Of the 156 treated, 4 had phthisis; 22 had hysteria or some neuropathy, thus confirming the opinion that female hysteria is often of alcoholic origin. Six suffered from arteriosclerosis, in 2 of whom (both cooks) the symptoms seemed to have arisen from the use of alcohol; 3 had gastric ulcer of alcoholic origin. In the interesting discussion which followed, Dr. Bourneville stated that of 1000 children at the Bicetre (1890-1895), in 471 the father had been a drunkard and in 84 the mother was alcoholic, but in 65 both parents were intemperate. No family history could be obtained in 171 cases, and alcoholism was not known to have been present in the parents of 209 children. In 57 cases conception had taken place during the intoxication of the father, and in 24 other cases there was a strong probability of this having occurred. These statistics point to the fact that alcoholism is probably more prevalent in France than in any other European country and that these efforts of the medical profession to present the truth and enlighten public opinion are, as the Journal terms it, "a hopeful augury of success in what Dr. Laborde calls a struggle against the true enemy." Efforts are now being made to have the physiological action of alcohol upon the human economy taught in the public schools of France. Teaching will be given by means of dictation, composition exercises and arithmetical problems on the material losses caused by intemperance. W. L. B.

THE PATHOGENESIS OF EPILEPTIC IDIOCY AND EPILEPTIC IMBECILITY.—W. Lloyd Andriezen, *British Medical Journal* (May 1, 1897), details the nerve cell and convolitional changes of epileptic idiots and imbeciles. He divides them into four groups: (1) simple, non-epileptic idiocy; (2) epileptic idiocy; (3) simple and non-epileptic imbecility; (4) epileptic imbecility. He proposes at the outset to exclude from research all cases of cerebral hæmorrhage, tumors, porencephaly, traumatism and all changes involving gross destructions of the brain tissue. After showing the cranial asymmetry of the various groups, he takes up the intracellular changes, using the toluidine method (modified Nissl).

1. *Changes in the Nerve Cells.*—(a) An increase of the normal golden pigment at the base of the cell body. Often this pigment has a ten-

dependency not merely to accumulate at the base, but to get, as it were, disintegrated, and diffused throughout the cell body. (b) A destruction of Nissl's granules in the areas invaded by the pigment. (c) A displacement of the nucleus towards the apex of the cell. (d) A thickening of the strands and knots in the intranuclear reticulum, and the production of a fine dust-like material (? *debris*) in between the meshes of the reticulum. (e) A deeper staining of the nuclear structures. (f) A diminution in the deepness and distinctness of staining capacity of the Nissl's granules in the pyramidal and polymorphic cells of the affected parts.

2. *Changes in the Neuroglia Cells.*—The changes in the neuroglia fibre-cells can be best seen with the Golgi silver stain. In most of his specimens these changes were of a striking nature. They can be revealed, also, with the use of haematoxylin, and of aniline blue black combined with (or without) picro-carmin. The total number of brains of epileptic imbeciles and idiots he examined comprise fourteen, the majority of these having been at the West Riding Asylum. It is by no means intended to state that these changes are restricted to the epileptics who are epileptic and feeble-minded. These sclerotic and nervous changes are also seen in epilepsy supervening later in life, that is, at the adolescent or adult period of life, and when the disease has been in existence for some years. The sclerotic change, however, is, generally speaking, not so far advanced or so abundant in the hemispheres. Here and there diffuse strands and sheets of sclerosed tissue are seen, in some places concentrated into firm, almost fibroid islets; in other places finely diffused throughout and infiltrating the brain substance. Where these changes occur in the deeper cortical and neighboring parts, the naked eye difference of color between cortex and white substance is often lost, and the tissue so infiltrated feels firm and even hard. Where several such spots or patches are aggregated, the brain substance feels knotty when pressed.

He found that in the brains of non-epileptic imbeciles sclerosis and microgyria are both conspicuous by their absence. When the epileptic neurosis is present, he found this process present. He concludes that no pathological basis exists for epileptic idiocy and imbecility, marked by anomalies of growth and nutrition impressed upon the growing nerve and neuroglia cell, and affecting this or that area of the brain to a particular vascular distribution. W. L. B.

APHASIA AND WILL-MAKING.—Byrom Bramwell, *Br. Md. Jour.*, May 15 and 22, 1897, discusses the legal responsibility of aphasics. In determining the will-making power of aphasics, he considers the variety or form of speech defect all-important on account of the different degrees of mental involvement or enfeeblement which may accompany. The impairment of the mental and intellectual faculties is greater in cases of sensory aphasia (word-deafness and word-blindness) than in cases of motor aphasia, while in cases of combined sensory and motor aphasia the mental impairment is always profound. He states that, other things

being equal, the greater the degree of the aphasic defect the greater the mental impairment and the less the will-making capacity of the individual. In addition, the age of the patient, the conditions of the cerebral arteries and the state of the brain tissues prior to the cerebral lesion must be taken into account. In determining the mental capacity of an aphasic, the author insists on a distinction between subcortical (pure or isolated) aphasias on the one hand and cortical (true) aphasias on the other, the latter causing a more profound change in intellectual function than the former. He calls attention to the fact that the average layman with his faculties undimmed has difficulty in comprehending the meaning of such a complicated legal document as a will; and it is unreasonable to expect aphasic patients, whose brain power is usually weakened to some extent by disease, to understand such a document. Two difficulties are brought forward: *First*, that of determining the exact mental condition of patient, and, *secondly*, that of ascertaining the exact way in which he wishes to dispose of his property. When the will of an aphasic is drawn up his medical attendant should always be present with the object of assisting the lawyer in ascertaining the wishes and desires of the patient. Dr. Bramwell discusses each variety of speech defect separately, and determines that in cases of subcortical motor aphasia the patient is usually capable of making a will, especially if the sensory realms remain uninvolved. In sensory aphasics from subcortical lesions (subcortical word-blindness) the patient is usually incapable of making a will owing to the associated alterations in the mental faculties. In cases of cortical or true word-blindness the mental involvement is usually slight or *nil* and does not prevent patient from making a will. Cases of word-deafness, even without associated mental defects, are incapable of making a will unless they rely on pantomime.

In cases of combined motor and sensory aphasia the patient is unable to express his wishes and the mental involvement usually is profound. In all these cases will-making will be found impossible. In young or middle age subjects particularly, where the lesion is an embolic infarction, it is best to wait a few months, as many cases improve to such an extent as to be able to intelligently communicate their wishes in broken speech, in writing or by pantomime.

W. L. B.

THE ALTERATIONS OF THE NERVE ELEMENTS IN EXPERIMENTAL URAEMIA.—Sacerdotte and Ottolangi, *Rivista di Patologia nervosa e mentale*, January, 1897, from an experimental study, conclude:

1. That ligation of both ureters or bilateral nephrectomy causes in the nervous centres lesions readily discernible by Golgi's method, and characterized by varicose atrophy of the dendrons of the ganglion cell, while the nerve prolongation is unaffected. Moreover, contrary to the statements of Acquista and Pusateri, the neuroglia also participates in the alteration.

2. As regards the distribution of the lesions:

- a. The degenerated elements are scattered throughout the cerebral cortex and appertain to various categories of cells.

b. Less numerous than in the cortex, but still abundant, are the altered cells of the pes hippocampi.

c. In the cerebellum the nerve cells of the molecular stratum show degeneration.

d. The neuroglia is more or less altered in all regions studied.

H. M. B.

THE TOXICITY OF THE PERSPIRATION IN EPILEPTICS.—Clementa Cabitta, *Rivista Sperimentale*, xxiii, i, 1897, gives the results of a series of experiments on the toxic properties of the sweat in epileptics in the following deductions:

1. The sweat of epileptics in the prodromal period of the attacks shows, when injected into the circulation in rabbits, a decided toxic action and marked convulsivant property.

2. This toxic and convulsivant action increases gradually as the time of the attack approaches, and continues during the post-epileptic period that immediately follows the paroxysm.

3. The attacks suffered by the patient the day before the experiment exerted no influence upon the toxicity of the perspiration.

4. In periods distant from the attacks the action of the sweat of epileptics does not appear to be different from that of healthy individuals.

H. M. B.

In a paper immediately following the above, Cabitta gives the therapeutic corollary in these experiments. He tried the effect of hot-air baths on four epileptics and reports very marked benefit from them in reducing the number of attacks. He concludes that there is eliminated in the perspiration of these patients a substance that produces an auto-intoxication; he finds that the toxicity of the perspiration is inversely as that of the urine, and that the hot-air bath is an excellent means for preventing and interrupting the epileptic attacks. He believes that it, combined with intestinal antiseptics, and without neglecting other suitable treatment, is in many cases of general epilepsy a rational and logical treatment and sometimes a non-depressing substitute for the bromide treatment.

H. M. B.

URINARY TOXICITY IN THE INSANE.—Pellegrini, *Rivista Sperimentale*, xxiii, i, 1897, finds that in the urine of the insane there is an excess of potassic indoxylsulphate, and that this is true of all forms except the phrenasthenias (idiocy, imbecility, mental weakness). It is particularly abundant in the toxic insanities and in paresis. He believes this salt in the urine to be an index of its toxicity, and that its appearance depends upon a disordered condition of the digestive apparatus, and offers a theory of a digestive auto-intoxication in the etiology of paresis.

H. M. B.

Book Reviews

Jahresbericht der niederoesterreichischen Landes-Irrenanstalten Wien, Ybbs, Klosterneuberg und Kierling-Gugging, der niederoesterreichischen Landes-Irrenzweiganstalt in Langenlois, sowie der sonstigen Anstalten zur Unterbringung geistesgestoerter niederoesterreichischer Landes-pfleglinge pro 1895-'96. [Report for 1895-'96 of the Asylums for the Insane and Feeble-Minded of Lower Austria.]

This volume contains an introductory note and summary by the Provincial Committee of Lower Austria, and the reports of the institutions mentioned in the title. At the close of the year 1894 the asylums for the insane contained 2283 patients, who increased to 2421 at the end of the following year. The percentage of recoveries on admission was 39.1, an increase of 6.1 upon the preceding year, and the percentage of deaths was 28.1, an increase of 0.05. The central committee refer to the modern tendency of hospitalization of asylums, which is exploited in greater detail in the reports of the individual institutions. In these, the beginning of the reform is indicated in an attempt to abandon the seclusion of patients and the adoption of a system of bed treatment for acute cases. A very small number of patients now remain in isolation, and a large number are detained in bed, with satisfactory results.

The asylum reports contain the usual recapitulation of the administrative features of the year, and several publish, in addition, contributions upon subjects of special interest, together with clinical cases. Among these is a report from the institution at Langenlois, by Dr. Bogdan, upon the care of the helpless, wet and dirty cases, with consideration of the use of hypnotics. Trional has proved to be the favorite drug of this class. Daily intestinal irrigation has been found serviceable not only as a therapeutic measure, but as a prophylactic against the irritative diarrhoeas due to inactivity of the bowels. In the same institution a bathing-room, permitting the use of running water (evidently a spray apparatus), has been established, and has resulted in the stamping out of a contagious eye affection. The asylum at Langenlois, in which this procedure has been adopted, was created in 1891 and 1892 for the reception of patients afflicted with trachoma, which was epidemic in the other institutions of the province.

From its location in the city and near the great *Allgemeines Krankenhaus*, the Mecca of American physicians, the asylum in Vienna is of special interest. In this institution, with 800 patients, is located a clinical department under the charge of Dr. Julius Wagner von Jauregg, assisted by Drs. Adolf Elzholz and Emil Redlich, the latter a Privat-

docent. Demonstrations are given here regularly, and instruction in neurology and psychiatry is arranged for classes of visiting physicians. Dr. Wagner is especially known for his experiments with tuberculin in the induction of an artificial infection for the cure of insanity, and Dr. Redlich is a patient investigator in the pathological anatomy of the nervous system. The medical activity of the Vienna Asylum is shown in its report, which contains a full description of a medical library and reading room, and a clinical laboratory. Four papers were contributed to medical literature by the staff during the year. The advantages of the institution as a training school for asylum physicians is urged in the report. The need of this and of more general teaching of psychiatry is further emphasized in the report from Kierling-Gugging.

No reference is made to the service of Krafft-Ebing, whose clinic is in the general hospital in Vienna, from which it may be inferred that supervision of the insane in the general hospital is not made by the provincial committee.

Atlas of Clinical Medicine. By BYROM BRAMWELL, M. D., F. R. C. P., Edin., F. R. S., Edin., Assistant Physician to the Edinburgh Royal Infirmary, etc. Volume III, part 3. Edinburgh: Printed by T. and A. Constable, at the University Press. 1897.

This fasciculus completes Dr. Bramwell's Atlas, the different parts of which have been noticed in the JOURNAL as they have been issued. The present number contains papers upon pseudo-hypertrophic paralysis and progressive muscular atrophy, cyanosis and congenital heart disease, calcareous degeneration of the heart, chlorosis, pernicious anæmia and alopecia areata. The three volumes thus concluded cover a great diversity of subjects in the general domain of clinical medicine, the text having been prepared with the care and thoroughness characteristic of all of Dr. Bramwell's work. In fact, it is a matter for the wonderment and self-gratulation of his readers that he is able and willing to present in such attractive style the results of his vast and well-digested clinical experience. The three volumes in question are of special value to alienists and institutions for the insane on account of the liberal amount of space given to some of the degenerative forms of nervous disease, and the excellent chromo-lithographs illustrating various phases of mental disorder. Among these may be enumerated the plates showing myxœdema, sporadic cretinism, melancholia with fear, mania, melancholia, dementia and senile dementia.

The work as a whole is one of the most pretentious undertakings in medical literature attempted by a private individual. This is the greater reason why the patronage should be liberal, especially on the part of public institutions, which have a certain duty in the promotion and encouragement of such enterprises as that undertaken by Dr. Bramwell.

The Atlas is a folio. There are one hundred plates, $14\frac{1}{2} \times 10\frac{1}{2}$ inches, done in black and white and colors in the best style of the printer's and engraver's art. It may not be out of place to add that the price to subscribers is only \$7.50 per volume.

Notes and Comment

DEATH OF DR. STEEVES.—James T. Steeves, M. D., late Superintendent of the Provincial Lunatic Asylum of St. Johns, N. B., died of paralysis at his home in Lancaster, March 3, 1897. He had been in feeble health for some months, but had been able to drive out until within a few days of his death.

James Thomas Steeves, M. D., was born at Hillsboro, Albert County, on January 25, 1828, and was therefore 69 years old at his death. His early education was received at the grammar school at Hillsboro, at Sackville Academy and the Baptist Seminary, Fredericton. He studied medicine at the University of Pennsylvania and the University of New York, graduating in 1853 with a certificate of honor for proficiency. In 1854 Dr. Steeves settled down to practice in the old town of Portland. He was practicing there during the period of the cholera. In 1864 he removed to the east end, or St. John City, and erected the block of four buildings at the corner of Wellington Row and Union Street. He resided there until 1875. When the general public hospital was opened in 1864, Dr. Steeves was appointed one of the visiting surgeons, and was the last of the original staff retiring. When the late Dr. Waddell retired from the superintendency of the Provincial Lunatic Asylum, Dr. Steeves was recommended for the position, and was appointed, retaining that important office until failing health compelled his retirement a little over a year ago. Of his work there, the *Cyclopedia of Canadian Biography* in 1888 said: "Dr. Steeves is a strong advocate for segregation, pavilion accommodation and employment for the insane. By means of his advocacy with pen and voice, he has induced the government of New Brunswick to purchase a large farm, and to erect thereon a group of pavilions for the care and employment of a suitable number and class of the most healthy indigent and pauper insane. The establishment

is in full working condition, and is regarded as a complete success, in that it is far better than the old hospital system for this class of patients, giving them more freedom and out-door work, and that it is far more economical both in buildings and maintenance."

It is well known to the people of the province that great changes and improvements were made in the asylum property, as above indicated, and in the general treatment of the insane during the long period of Dr. Steeves's superintendency. He was a man of excellent ability and brought great energy to the discharge of his arduous duties.

Dr. Steeves was elected a member of the first medical council of New Brunswick in 1860. He filled the position of vice-president of the Canada Medical Association, was an honorary member of the American Medical Association, was first president of the N. B. Medical Society under the act of 1880, and had also filled the position of president of the N. B. Medical Council.

Dr. Steeves was elected a member of the first medical council tries and attended meetings of medical superintendents of asylums, thus, and in other ways, keeping himself thoroughly in touch with the best science of the day in regard to the treatment of the insane. He never spared himself, and it is not too much to say that he sacrificed his health and strength for the good of the insane of New Brunswick. He was a clever writer on subjects relating to his profession and official duties.

TRAINING SCHOOLS FOR ATTENDANTS.—The admirable paper of Dr. Wise before the Baltimore meeting of the Association, and the discussion which it elicited, indicate the lively interest which is felt by all alienists in better methods of training attendants upon the insane. Universal disappointment has been expressed that absorbing executive duties have prevented Dr. Cowles, the chairman of a committee appointed some time ago to prepare a manual for the proper organization of training schools, from putting the results of his earnest thought and experience before the Association.

At present, little uniformity of practice exists in admitting pupils to training schools connected with hospitals for the insane, and even less uniformity is found in the length of the period of

study or in the curriculum of study pursued. The result has been, in many instances, that nurses upon the insane have received certificates as trained nurses when their training has been meagre and unsatisfactory. Many have been trained to nurse the insane alone, and have had little or no opportunity to secure practical instruction in surgery, gynecology, obstetrics or even in general medical diseases. It is anomalous that attendants with such one-sided and imperfect training should receive certificates of competence as trained nurses from excellent institutions with high aims under conscientious management. No intentional wrong to the public has been intended, but it is evident that among superintendents and resident physicians of institutions for the insane the true meaning of training as applied to a nurse is misapprehended, and it is equally true that much remains to be done to put the training of nurses for the insane upon an equal footing with the training of other nurses. How to draw the line between the mere attendant and the nurse, how to retain a trained man or woman to care for an insane patient after a knowledge of general sick nursing has once been acquired, and, above all, how to present sufficient pecuniary inducements to nurses upon the insane to counterweigh the pecuniary and other advantages offered to those who are fitted to do private nursing,—these are problems which must engage the best thought of alienists who desire better nursing for their insane patients. It is pretty generally agreed that a nurse trained in a general hospital does not take kindly to the care of the insane; many nurses think this work monotonous and not calculated to call into activity the highest qualities of the nurse. Ordinary nurses also, when brought into contact with the insane, often find themselves lacking in self-reliance and versatility. On the other hand, it is asserted that a nurse skilled in the care of them, and thoroughly interested in this work, lacks an equal interest in the care of the sick. The nursing of the two classes of patients seems without common ground or equal interest. It would probably be more correct to say that there is a tendency on the part of nurses upon the sick and the insane respectively to adhere to the lines originally laid down for them; they rarely transfer their interest or usefulness from one field of nursing to the other. This is to be regretted, because both classes of nurses

could unquestionably help each other if a community of training could be established. The suggestion has been made that every training school of nurses for the insane should arrange for its pupils a period of instruction of at least six months (preferably of one year) in a general hospital, to be supplemented in the case of women nurses by service in a lying-in hospital. Others have preferred to have the training of nurses begin in a general hospital, where the groundwork of instruction, and, in fact, the greater portion of theoretical instruction could better be given, to be followed by a service of six months in an institution for the insane. This course of instruction formerly obtained in the Philadelphia Hospital, where both the sick and the insane are cared for under the same roof, but was given up several years ago in consequence of serious administrative difficulties. As these difficulties were not insurmountable, it is to be hoped that this method of training attendants upon the insane may receive further trial. It is evident that the training of nurses for the insane has not yet gone beyond the stage of experiment. There is danger of too low a standard of requirement both in selecting, instructing and graduating nurses. Nursing the insane needs to be dignified and perfected. To this end nurses should be older when accepted for training; training should be thorough and long enough continued to secure good results; trained nurses should be fittingly paid so that their services may be retained by institutions who have trained them. New York, while setting a good example in respect to training schools, has been lacking in liberality of salary to trained nurses. Think of a yearly addition of one dollar per month! Her expectation of life must needs be great to secure a liberal reward for her services under these circumstances.

A HOME FOR THE INSANE ON MOUNT LEBANON.—The need of a proper institution for the care of the insane in Syria has become evident to the European and American missionaries, and a movement to enlist the sympathy and assistance of the Christian world has been inaugurated by Mr. Theophilus Waldmeier, the founder and late Superintendent of the Friends' Mission on Mount Lebanon, who consecrates the remaining years of his life to this object. Mr. Waldmeier has visited Europe, where he has

received the encouragement and active support of prominent alienists, among whom may be enumerated Dr. Forell, Prof. Kraepelin, Dr. Rabow, Dr. Sioli, Dr. Clouston, Dr. Yellowlees, Dr. Bedford Pierce, Dr. Jones of Claybury, and others. Local committees and treasurers have been appointed and subscriptions have been received. It is estimated that about \$50,000 will be needed. Mr. Waldmeier has been observant of methods and plans, and proposes to construct a modern cottage asylum under medical direction. He appeals to the civilized world, whose missionaries have accomplished so much in the regeneration of the East, to assist in the realization of this most humane plan, and suggests that the different blocks of the Home be allotted to the different nationalities, *e. g.*, an administration block with the needed land to Great Britain, and cottages to Germany, Switzerland, America and Syria.

In the circular issued by Mr. Waldmeier, a most interesting account is given of the methods of treatment of the insane in the convents of the East, based upon the ancient theory of demoniacal possession. One of these, Kuzheya, is a Maronite convent on the heights of the northern parts of Mount Lebanon in the district of Batroon. Its position is romantic and its building is old and strong. It is one of the oldest of the numerous convents of Batroon and Kasrawan. The general superstition of the people is, that these convents are holy places where God works many miracles; and that each of these monasteries is in possession of a special healing power, and in this way Kuzheya, with its large cave, has the reputation of curing the insane. The cave has a small entrance at the side of a deep valley, but it widens and extends inside to great dimensions, and is both damp and rugged. The water drops down on every side and forms here and there small stagnant pools. The inside is, in winter, extremely cold, and as the water abounds in lime salts, stalactites of different shapes are formed, generally long pillars. The monks break the smallest of these into little pieces, bore little holes in them, and sell them as relics to visitors, who hang them around their children's necks, believing that they thus avert evil.

Along the rough natural wall of the cave are blocks of stone placed as seats for the lunatics, and behind every seat is a heavy iron chain, bolted and strongly fixed into the solid rock for the

detention of the insane. When the patient is received at the convent, he is given over to the monks in charge of the cave. He is pulled through the narrow entrance, forced upon the stone seat, and, if he resists, is beaten down. The chain is fastened about his neck, and he is detained for three days and three nights under the expectation that St. Antony will then cast out the demon. St. Antony failing, the treatment is continued, and, when thought necessary by the monks, a ceremony of exorcism is performed. A priest takes a heavy boot in his right hand and beats the insane person repeatedly upon his forehead, while he holds in his left hand the *stola* and the book from which he reads the formula of exorcism, saying: "Get thee away from this person, accursed devil, and enter into the Red Sea, and leave the temple of God. I force thee in the name of the Father, the Son, and the Holy Ghost, to go to the everlasting fire," etc., etc. Upon the death of the patient, which usually ensues, the monks announce that St. Antony has taken him up to heaven, and a heavy fee is collected from the relatives.

The interest of both the foreigners and natives of Syria has been enlisted in the proposed asylum, and an executive committee has been selected at Beyrout, consisting of Rev. John Wortabet, M. D., President; Rev. Henry Jessup, D. D., General Secretary; Charles Smith, Esq., Treasurer; Esbir Eff. Shkeyr, Assistant Secretary; Assad Cheyrallah, Esq., Assistant Secretary; Drs. Brigstock, Graham and William Van Dyck and Mr. Waldmeier.

Mr. Waldmeier has reached America, and it is to be hoped that a generous response will be given to his appeals in behalf of the first hospital for the insane in the Orient.

DEATH OF DR. ROBERT H. MOFFITT.—Robert H. Moffitt, M. D., was born near Ottawa, Canada, August 26, 1868, and died at Lake Bluff, near Chicago, June 10, 1897. Dr. Moffitt, after securing his preliminary education, was a teacher for some time, and studied medicine. He graduated from the Northwestern University College of Medicine, Chicago, Illinois, in 1894. The same year he was appointed as Assistant Physician at the Iowa Hospital for the Insane at Mt. Pleasant, Iowa, where he remained until his last illness. He was most faithful and painstaking in the performance of duty, much beloved by his patients and trusted

by his superior officers. He gave promise of a most useful life in the special work to which he had devoted himself. He leaves a wife to mourn his loss, with many other devoted friends.

POLITICAL CONTROL OF HOSPITALS.—The attempt on the part of politicians to control the positions in the insane hospitals of some of the Western States calls for an earnest protest from all honest and intelligent physicians, not only among members of the hospital service, but from the outside profession as well, for although such changes would in reality affect the general public much more than it would the members of the profession, still we can hardly expect that the outside element will take the initiative on a subject that is entirely beyond its sphere of thought and comprehension.

The average layman has no adequate standard by which to test the relative competency of different physicians. He knows no reason why one successful practitioner should not be as competent to care for the insane as another, and does not understand that a thorough knowledge of insanity can only be acquired by practical experience in asylum work. But we of the profession, who understand this, know that to put the management of one of our large asylums into the hands of a man who has had little or no practical experience among the insane is to subject the public to a danger far worse than that of ordinary financial mismanagement, since this danger is to the lives, and not the purses, of the people. If the public itself cannot appreciate this without first trying so dangerous an experiment, it is becoming in us, as medical men, to point out the folly of it.

Kansas tried the experiment of including asylum positions in the list of political spoils; and she has never fully recovered from the effects of the mismanagement which resulted. Iowa also dipped tentatively into the fatal pool, but was fortunate enough to realize her mistake in time to avert a plunge similar to that of her trans-Missourian sister. And other States seem likely to be captured in the fatal snare unless some vigorous measures are adopted to prevent it.

It should be remembered that the science of medicine is sufficiently complicated and progressive to require the entire time and attention of any man who attempts to keep pace with its

progress. The asylum physician can find abundance of use for his time in legitimate duties without attempting to follow the intricacies of political chicanery, even were it otherwise consistent with his self-respect to do so.

If the few positions open to medical men are to be obtained or controlled through political influence rather than the fitness of the individual, then the honest asylum physician has no alternative but to renounce his calling. He cannot descend to the plane of political spoilsman and ward-heeler. If we are still to maintain the dignity of our profession, we cannot too loudly decry those measures which tend to degrade it, or too vigorously condemn those members who forget their obligations as colleagues in a noble calling.

ADMISSION OF VOLUNTARY PATIENTS TO HOSPITALS FOR THE INSANE.—It is probably within the experience of most superintendents of hospitals for the insane, that persons have applied either personally or by letter to be received for care and treatment. In addition to these cases, it not uncommonly occurs that patients, whose friends have thought necessary to commit them to hospitals by due process of law, while protesting against forcible commitment and detention, have stated that they appreciated the need of some kind of care and supervision and would have willingly acceded to their friends' suggestion had they been first consulted.

It is not at all improbable that in a certain proportion of cases such statements are made for effect, but in many instances it is undoubtedly true that patients who are now committed would follow the advice of their physicians or friends and voluntarily seek the care which has been forced upon them. The wisdom of permitting such cases to act for themselves is always open to question, and in many instances the mental instability of the patient forbids such a course. Experience, however, has shown that under proper supervision, and surrounded by wise safeguards, the insane may be received into hospitals designed for their care and treatment to a larger extent than is commonly supposed.

There seems to be no reason why patients may not as properly apply at the doors of a hospital for the insane for care and treat-

ment and be received and detained as at any hospital. In a large number of such voluntary cases there are necessarily a few who will be dissatisfied, restless, vacillating and uncertain, like all patients received into general hospitals, but such cases as a rule can be readily managed if a distinct understanding is had with them and their friends at the outset. This understanding or agreement must necessarily take into consideration the fact that the person applying for admission to a hospital for the insane is probably either approaching or passing through a period of mental disturbance, and if such patients are clearly told that no attempt will be made to detain them after they have signified their desire to leave the institution beyond a reasonable period in which to notify their friends to assume charge of them there can be no reasonable objection to permitting their entrance to a hospital as voluntary cases. It not infrequently occurs that cases of chronic insanity with well marked mental symptoms, while refusing to admit the extent and nature of their mental disturbance, recognize to a degree its presence and willingly and not infrequently of their own motion seek care and treatment. Every hospital superintendent of long experience can recall such cases. Why should it be necessary to commit by legal process such patients, or why should their detention under reasonable safeguards be regarded as improper? In England, and in certain of the United States, under varying restrictions, the admission of voluntary patients is permitted. It seems to us that if the reception of such patients could be recognized in the laws of the various States and the judgment as to what patients might properly be received as voluntary cases left with the medical superintendent, under proper safeguards of course, the personal liberty of the patient would be properly protected and the legal responsibility of the institution thoroughly recognized. The recent act to amend the Lunacy Laws of the State of Maryland, which unfortunately failed to pass both Houses of the Legislature at its last session, contained a provision for the reception and care of voluntary patients as follows:

"The medical superintendent or other chief medical officer of any institution, hospital, home or retreat for the insane, except almshouses, may receive and detain therein for purposes of care and treatment at the expense of such person, or the expense of

his relatives or friends, any person who is desirous of submitting himself to treatment and makes application therefor in writing. No such person shall be detained for more than three days after having given notice of his desire and intention to leave such institution, nor shall any person be received or detained as a voluntary patient whose mental condition is such, or becomes such, that such person cannot comprehend the act of voluntary commitment, or be able to request his discharge or give continuous assent to detention. Every such voluntary patient so admitted shall be reported to the Lunacy Commission as provided in cases legally committed and shall be further reported to the Lunacy Commission, with a statement of the mental condition of said patient at the end of each three months of said patient's residence in the institution to which he has requested admission, and when discharged therefrom. A copy of this section shall be read or exhibited to every person requesting admission to any institution in accordance with its provisions."

The above provisions would have thoroughly protected the interests of all concerned if carefully observed and thoroughly carried out. It was obviously intended to prevent the reception, as voluntary patients, of weak-minded individuals who are coerced into going to an institution by their friends, or the detention of patients who have voluntarily asked admission, in case of such changes occurring in their mental status as would prevent the full comprehension on their part of their status in the institution and of their right to demand a discharge at any time after due notice. The report of such cases periodically to the Commission of Lunacy, with a statement of their mental condition at the time of such report, would seem also to surround them with all protection to their personal liberty which could be demanded, as it would obviously be the duty of the Commission, in case any patient seems to be detained as a voluntary case, whose condition is such as would make such detention in their opinion improper, to take the necessary and proper steps to secure his discharge or his commitment by his friends according to the forms prescribed by law.

Opportunities for voluntary commitment should be freely offered to early cases of mental disturbance, and we are firmly convinced that their reception into hospitals for the insane would

redound not only to their good, but to the general benefit of the institution, as it would tend to lessen the complaints of the discontented, to some extent. If they saw that others voluntarily sought the care which they thought unnecessary and the restraint under which they were chafing they would, as experience has proven in some instances, cease complaining. If those concerned in the management of hospitals for the insane are to succeed in breaking through the popular prejudice against such institutions, it will be largely accomplished through encouraging incipient and early cases of mental disturbance to seek their care and protection and convincing the public that while the doors open freely inward they are as freely opened outward.

DEATH OF SIR JOHN CHARLES BUCKNILL, M. D., F. R. S.—The death of Sir John C. Bucknill at his residence at Bournemouth on the 20th of July, after a protracted illness, is announced in our exchanges. We are indebted to the *British Medical Journal* and the *Lancet* for the following facts concerning Dr. Bucknill. In a subsequent number of the JOURNAL we hope to present to our readers a more extended notice. Dr. Bucknill was born at Market Bosworth, Leicestershire, in 1817. He was educated at the schools of his home and at Rugby, and in 1840 took the degree of M. B. in the University of London. In 1844 he was appointed the first Medical Superintendent of the Devon County Lunatic Asylum, and in 1853 was the first editor of the *Asylum Journal*, now so well known as the *Journal of Mental Science*, which was then published, as at present, under the control of the Medico-Psychological Association of Great Britain, then known as the Association of the Medical Officers of Asylums and Hospitals for the Insane. From the beginning, Dr. Bucknill seems to have taken a very active interest in medico-psychological affairs and was a voluminous contributor to the literature of the profession.

His earliest published work was the Sugden Prize Essay entitled "Unsoundness of Mind in Relation to Criminal Acts," which was published in 1857. In the following year was published the work by which he is best known to the medical profession—the "Manual of Psychological Medicine"—of which he was co-author with the late Dr. D. Hack Tuke. In the two

following years he published interesting essays on the "Mad Folk of Shakespeare" and on the "Medical Knowledge of Shakespeare." In 1876 he published "Notes on the American Asylums," and in 1878 on "Habitual Drunkards and Insane Drunkards." Two years later he published a work on the "Treatment of the Insane and their Legal Control."

The above list does not include numerous reviews and editorials and other contributions to the *Journal of Mental Science* and other medical periodicals. In July, 1894, knighthood was conferred upon Dr. Bucknill. It has always been understood, and, indeed, the British journals giving notice of his death clearly intimate that this honor was conferred largely as a recognition of his public services in originating and perfecting the volunteer movement in Great Britain. Dr. Bucknill was the first volunteer recruit enrolled in the primary regiment of volunteers in England, the First Devon and Exeter Volunteer Rifles. It seems rather remarkable, and to the moralist affords material for reflection and comment, that a man of Dr. Bucknill's attainments and labors in the particular field of science to which he devoted his life should receive recognition at the hands of his government for services in an altogether different and subordinate field. Dr. Bucknill had many friends in America, and among his published writings will be observed Notes on American Asylums, published in 1876 after a visit to some of the asylums of this country. Many American asylum physicians who have visited Great Britain were, like the writer, under great obligation to Dr. Bucknill for many courtesies which he extended to them.

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(*Extracted, by permission, from the Index Medicus.*)

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THE MEDICAL AND MATERIAL ASPECTS OF INDUSTRIAL EMPLOYMENT FOR THE INSANE.¹

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Carlyle says somewhere, "There is always hope in the man who actually and earnestly *works*. In idleness alone there is perpetual despair." True as this is of all men, it is especially true of the insane, idleness among them being oftentimes a symptom of their malady that calls for active treatment by active work. Nothing new in this doctrine, say the quidnuncs; and they are right. It has been preached for generations, and in some institutions preaching and practice go hand in hand as blessed means of saving multitudes of insane men and women from chronic insanity, or of making the chronic lunatic a contented, peaceful, useful member of society despite his detention. But I am convinced that much remains to be done everywhere to secure for occupation the eminent place to which it is entitled in practical therapy. It is human nature, especially among physicians, to think and speak slightly of simple, plain, every-day curative agencies and to exaggerate the healing virtue of the unknown quantity. With respect to drugs, while we doubtless understand their action better than our forebears, and realize that in their relation to the *corpus vile* they are, like everything else in this

¹ Read before the American Medico-Psychological Association, May 13th, 1897.

world, subject to law, we often exhibit a child-like faith that suggests the mysticism of the middle ages. Our mail brings day by day a new claimant for recognition fresh from the press of the wholesale drug house, and latterly even the transatlantic pharmacist, not backward in his appreciation of our craving for things European, thrusts his foreign envelope under our noses to call our eager attention to some new remedy of strange name. So we go on experimenting with this drug and with that, year in and year out, groping, vaunting, doubting, spurning, each by turn, till finally we sometimes lose faith in the permanent value of any drug and run the risk of ultimate entrance upon the stage of therapeutic nihilism. Thus it happened, not long ago, that when a member of this Association assumed charge of a high class private hospital, the only drug which he could find in the dispensary was that much advertised remedy whence "gladness comes." By all means let the careful, patient, scientific experimentation go on, but let us give to that much abused word "scientific" a wider range of meaning, regarding science as that limitless field of mental activity which is concerned in the deducing of general laws or principles from observation of phenomena; truth or knowledge, of whatsoever kind, ascertained by observation, experiment and induction. In other words, let us not for a moment allow ourselves to think that "bottle medicine," to which the layman pins his faith, is scientific treatment for the insane, while work as a curative agency is not. The contention of this paper is that as compared with drug treatment, so far as the great mass of any asylum population is concerned, that by occupation, properly systematized and diversified, is of immeasurably greater consequence. And inasmuch as the drugs chiefly prescribed in hospitals for the insane are narcotic, I will go further and assert that these latter may in the long run do more harm than good. But let us insist that work is treatment and not entertain the belief, born of centuries of foolish tradition, that because we are not putting nauseous drugs into our patient's stomach we are not doing him or his friends full justice. To the question, "Is he taking any medicine, doctor?" let the answer come boldly, when necessary, in much the same emphatic manner as a few years ago a certain railroad magnate expressed himself in New York with reference to the public.

If there must be a philosophical, that is, "scientific" reason for our attitude on this question, and it seem necessary to talk learnedly of brain cells to secure recognition for employment, one may call attention to the grounds upon which the modern pedagogue approves manual training as an integral and important part of education and, *mutatis mutandis*, point the obvious moral. Let it be remembered that the motor area in the brain for the arm and hand is vastly larger than that controlling any other portion of the body of equal size except the face, showing that it requires a vast number of cells to effect the fine adjustments and delicate co-ordinations of the muscles of the hand in its infinite variety of movements; that nerve cells, motor as well as sensory, grow and develop like any other part of the body through nutrition and functional activity, and that exercise, properly regulated, is essential to their healthfulness. We sometimes lose sight of the fact, although it lies on the surface of cerebral physiology, that voluntary muscular movements have the effect not only of exercising the muscles involved, but also of calling into activity the motor cells which control them; that these motor cells are made to act and develop only by means of the muscles; and that, therefore, exercise is indispensable to the proper development of the motor area of the brain.¹

Indeed, so great an authority as Crichton-Browne reminds us that "in persons who have been long bed-ridden by chronic disease and debarred from all muscular exercise, the whole motor area of the brain is, after death, more or less atrophied and water-logged. It is unquestionably essential to the welfare of all motor centres, and especially of the large and complicated motor centres of the hand, that the parts with which they are immediately connected should be used in an active and varied manner."² And as showing the important part played by these motor cells in brain nutrition, the observation is in point that the amputation of an arm or a leg during childhood is vastly more detrimental to the corresponding brain centre than a like sacrifice of limb in the adult. In his charming essay on "An Apology for Idlers," Robert Louis Stevenson insists that "extreme busyness, whether

¹ See Manual Training. An address delivered before the Massachusetts Teachers' Association at Worcester, Mass., Nov. 30, 1895, by Thomas M. Balliet.

² *Ibid.*

at school or college, kirk or market, is a symptom of deficient vitality; and a faculty for idleness implies a catholic appetite and a strong sense of personal identity." All very well this as a special plea and as a special club with which to attack that "sort of dead-alive, hackneyed people who are scarcely conscious of living except in the exercise of some conventional occupation." But it does not affect the proposition that physical energy means a good motor brain area and, conversely, that physical laziness implies defect there. Moreover, your average patient in an asylum has neither catholic appetite nor strong sense of personal identity, and cannot, therefore, give himself over to random provocations. "It is no good speaking to such folk; they cannot be idle; their nature is not generous enough," says Stevenson, "and they pass those hours in a sort of coma which are not dedicated to furious moiling in the gold-mill." The argument for the continuous employment of the insane could not have been more happily stated by an experienced alienist who had witnessed in his wards the baneful effects of idleness and noted the blessed change wrought by active employment in insane folk whose nature was not generous enough for idleness. It was the recent experience of Nansen in the management of his crew of brave sailors in Arctic seas, and so it must ever have been and will ever be.

I began my paper by disclaiming novelty for my theme. Such disclamation eminently befits the successor of Amariah Brigham, the first superintendent of the Utica State Hospital, who, in his first annual report, that for the year 1843, showed a wonderful foresight and a masterful grasp of the conditions that confronted him in his pioneer work for the insane of New York. Hear his words: "That many of the insane are benefited by labor, especially in the open air, is unquestionable. . . . The number able to labor will vary in different institutions. In some, especially in those that have been long established, are many old and incurable cases that are made much happier by daily labor. In such institutions these may be classified and taught trades, and do much towards supporting themselves. I hope the time will speedily come when, in every State, good asylums will be provided for this class of patients and for all the insane. I am clearly of the opinion that, with a good farm connected with

such asylums, and the judicious arrangement and management of shops, one-half of the incurably insane of our country would perform sufficient labor to support themselves and would be happier and more healthy for the exercise. Incurable cases, instead of being immured in jails and in the town and county poorhouses without employment, where they are continually losing mind and becoming worse, should be placed in good asylums and have employment on the farm or in the shops. In this way they would, in general, be rendered much happier and some would probably recover."

Nothing could illustrate more fitly the genius of Brigham as a pioneer in asylum management in New York than this passage from his first report; neither could anything silence more effectually the claims of those who would arrogate to themselves priority in the discovery of the promise and potency of work as a means of treating the insane. Not that Brigham was himself the first to lodge a caveat; indeed, it were a hopeless task to enquire who, among observing healers of the mind, first learnt the lesson taught by Ecclesiastes, the preacher, that "by much slothfulness the building decayeth and through idleness of the hands the house droppeth through." What boots the inquiry? Suffice it that to-day there is on this subject universal agreement.

It were an easy task, though to you tedious in the recital, to give case after case of patients who have been helped on the road to recovery from the moment of entering the fields or the workshops and being placed in surroundings that approximate the conditions of the sane extramural existence. That is not the purpose of this paper. All I care to do is to call renewed attention to an old subject and, if may be, to suggest the teachings of a personal experience. While at the Utica State Hospital, from the earliest days of Dr. Brigham's administration, over fifty years ago, field and shop work seem to have been recognized and put into practice, for some reason the latter had been allowed to fall into desuetude. There is no evidence that, until within recent years, shop work had at any time played an important part in the institution. There was a whittling-shop, so-called, and a few patients worked in the general shops of the asylum as is done everywhere. Printing was also carried on in a small way. But ten or eleven years ago there was no general workshop for patients in which large numbers of men

were systematically employed. This feature of the place has been a thing of comparatively late growth and evolution, till now, if Utica can claim a *genius loci* at all, something that distinguishes, pervades and dominates, it is its industrial shops. My desire and hope is that the presentation of this paper may have the effect of inducing more superintendents to go and do likewise, and thus, by removing this sign of particularity (which, as we know, is not generally considered that of sanity), bring each institution within the pale of accepted and conventional practice.

Work was begun in a small way by engaging an upholsterer, whose success as a jack-of-all-trades had been already demonstrated at the Morris Plains Asylum, New Jersey. Later, a like draft was made upon the Rockwood Asylum at Kingston, Ontario, where shop work was being successfully practiced, especially in brush making. It was a modest beginning, but such was the immediate success of the brush and mat-making and general upholstery work as a means of emptying the wards of restless or listless patients, that it soon became necessary to secure more space. Extension of buildings and enlargement of scope occurred *pari passu* till now the patients' manufacturing department occupies a building two stories high, 210 feet long and 36 feet wide. In this building there are employed, out of a population of 486 men, an average of 127 patients.⁴ Here follows an enumeration of the principal industries, together with the number of patients employed on April 21, 1897:

Industries.	No. of patients employed.
Making brushes and brooms	21
" mats	5
" stockings (by machinery)	10
" combs and buttons	13
" shoes	4
Upholstering	57
Printing, ruling and bookbinding	17
<hr/>	
Total.....	127

⁴ This does not include the tailoring department, where 8 patients are employed and where all the clothing is made for patients as well as attendants' uniforms. One tailor only is hired.

It will occur to this audience that so large a number of patients employed day by day in industrial pursuits would soon produce a surplus of wares if consumption were confined to one institution, and the intelligent and cautious inquirer may desire to know whether we have the temerity to brave the united forces of Labor, writ large, and recklessly to invite the attention and displeasure of that modern knight-errant, the walking delegate, in his espousal and valiant championship of the cause of *honest* as against institutional toil. The answer is that we evade that ubiquitous crusader and dodge his issue by keeping without the open market and offering our products only to our sister hospitals for the insane in the State system. This right is conserved to us by special statute, the Insanity Law of 1896 having specifically provided that "the State hospitals may manufacture such supplies and materials to be used in any of such hospitals as can be economically made therein."

To the State Commission in Lunacy the hospitals of New York are indebted for a quick apprehension of the possibilities of co-operation along industrial lines. Application to extend the scope of manufacturing enterprises at Utica met with favorable action and other hospitals were encouraged in a willingness to avail themselves of our products. Thus one large plant, centrally situated, is made to subserve the needs of the entire system in the manufacture of certain articles of supply. Primarily, the benefit to Utica is in the means of treatment, but, incidentally, there is a gain all round in the provision of well-made goods at the best possible prices. The total value of goods thus manufactured and sold, including printing and bookbinding, amounted during the year last past to about \$13,000. There were made 3978 dozen hose valued at \$3,179; 545 dozen combs at \$409; 287 dozen brushes at \$684; 35 mats worth \$60; while from October, 1895, to October, 1896, the amount of printing and binding done aggregated in value the sum of \$8,363. The important fact to be borne in mind is that, given the building, the machinery and the opportunity, there is no institution which could not do likewise. That the enterprise pays in dollars and cents admits of no question, but what is much more to the point is the payment in mental results. To find occupation of any kind for one's able-bodied patients is always an accomplishment,

but to empty one's wards of all but a few sick and feeble folk during the day is an *achievement* and one that is within reach of all who will earnestly make the industrial experiment. Therefore, I would respectfully commend the practice of New York in the matter of co-operation as well worthy of attention. It is, after all, a phase of the higher socialism of which we hear so much nowadays, the essence of which is co-operation, while individualism has as its underlying principle competition. The aim of this kind of socialism is the fulfilment of service. Institutions, by combining in any one State, can make themselves independent, in a large measure, of the mercenary middleman by manufacturing numerous articles of supply such as I have enumerated. And I am convinced that the policy is susceptible of the widest extension. If one hospital makes a specialty of workshops there is no reason why another, with a large farm, should not make an exchange of agricultural products, while a third might carry on a canning industry on a large scale. In institutions where it is not convenient to make clothing, a specialty might be made of that department in some other institution in the State. So, too, with shoes, caps, and the multitudinous articles that are needed by the insane. The pecuniary advantage of such an arrangement alone, to say nothing of its inestimable value as treatment, ought to commend it as a wise measure of economy. The State hospitals of New York, centralized as they are in administration, lend themselves admirably to co-operative methods. No one can fairly question the beneficent results of effective combination, and a doubting Thomas may be made to realize, by the patent facts of experience, that even a seat of State government may ultimately become, in one of its departments, a radiating focus of good-will and wise management. The latest experiment along these lines is to be the erection of a plant at the Manhattan State Hospital for the roasting of coffee and grinding of spices after purchase in bulk for all the hospitals.* Think for a moment what this means in a service that requires some 35,000 pounds of coffee per month. Presto! the middleman's profit vanishes to reappear in the cup in a form more acceptable to the patient consumer. So with spices.

* Since this paper was read the proposed coffee and spice plant has been erected at the Utica State Hospital.

Under this proposed arrangement pepper will be pepper, nothing else, mustard will lose in yellowness while gaining in pungency, and both will be wholesome, for in nothing is there greater fraud than in this matter of condiments. In all States where the insane are maintained as the wards of the State under State supervision, there would appear to be no practical obstacle to such co-operation save the selfishness of existing purveyors, and each year the ingenuity of superintendents would suggest new departures. And, by the way, do not beet sugar factories offer the opportunity to the asylum with ample land to grow sugar beets for conversion into, and exchange at the factory for, granulated sugar and utilization of the remnant for feeding stock?

One sometimes hears of the great difficulty experienced in some institutions in inducing patients to employ themselves. It is a difficulty that soon vanishes under the competent direction of an experienced supervisor who is in hearty sympathy with the medical staff in this department of his work. Once let work be recognized as an essential of treatment, and *vires acquirit eundo*. Others again dwell upon the danger of having patients near rapidly revolving machinery and dread the risk of sharp-edged tools. It is the same argument that one used to hear with reference to the disuse of restraint, the use of which made the restraint necessary. The lazy or conservative attendant sees an *a priori* objection to free employment in the closer supervision that the freer life involves. But let him once perceive the improvement in his patient's condition and he immediately becomes a convert to the new and humaner policy. Patients themselves are usually ready to escape from the ennui of their life in the wards and take naturally to work in the majority of cases, when they have experienced the new interests that occupation brings in its wake. The able-bodied patient sweats, and for him in return "the rich Arabia sweats her gums" in full reward for honest toil, the while the frankincense of hope and cheer displaces the gall and wormwood of a living death. "We grow weary when idle," said Boswell, to which Johnson replied: "That is, Sir, because others being busy we want company." Even so with the insane. The opportunity to work being, therefore, a privilege and bringing its special blessing in health, it has never seemed to me worth while to adopt the elaborate scheme of com-

pensation in vogue in some reformatories and in a few asylums, Broadmoor, for instance. Dr. Mercier^{*} regards the absence of reward for labor as a crying evil, and has suggested the use of tokens or tallies which should be exchangeable at the asylum stores for such various commodities as are valued by patients. To do this would seem inconsistent with the theory of work as treatment, unless perhaps the insane, like children, are to be paid for taking their medicine like men. Rather, it seems to me, is *labor ipse voluptas*, and its *dulce lenimen* such recreation as is provided in all well-regulated hospitals for the insane. For, to conclude, although advocating the use of work to the fullest possible extent consistent with health and safety, I would preach moderation in all things, saying, with Prince Henry: "I am not yet of Percy's mind, the Hotspur of the North, he that kills me some six or seven dozen Scots at a breakfast, washes his hands and says to his wife, 'Fie upon this quiet life! I want work:'"

^{*} Lunatic Asylums: their Organization and Management. Charles Griffin & Co., Ltd., London, 1894.

THE DEVELOPMENT OF THE HIGHER BRAIN CENTRES.¹

By STEWART PATON, M. D.

The aim of this paper is to present in a general way some of the relations which the anatomical structure of the higher brain centres bears to the production of psychological phenomena.

The existence of an intimate association between cerebral structure and the manifestation of the various degrees of mental activity was recognized by Anaxagoras. That philosopher said: "If man is more intelligent than animals, it is because his mind employs more developed organs." This idea was current in the writings of many of the classical authors, but was first discussed in the writings of Hugo of St. Victor and later by Descartes, and finally was more clearly outlined and taught by Hume. The comparative method of investigating psychical phenomena is said by Lecky to have received a new impetus from the teachings of George Ernst Stahl. He has been called the founder of this method. On the other hand, the purely theoretical character of some of Stahl's speculations must be kept in mind. Psychologists and anatomists are, however, certainly indebted to him at least for the suggestiveness of his teaching. He even attempted a fusion of psychology and physiology. These views were also ably supported by Cabanis at the end of the last century. The doctrine that the genesis of psychological processes is intimately dependent upon the structure of the nervous centres has been clearly enunciated and expounded by Herbert Spencer. His philosophical analysis of this law of correlation demands the earnest attention of all those who are interested either in the normal manifestation of psychical phenomena as studied by the psychologist, or in the morbid processes which claim the attention of the psychiatrist. A single sentence epitomizes this author's teach-

¹ Read before the American Medico-Psychological Association, May 13, 1897.

ing: "It is a conspicuous fact that mental action is contingent on the presence of a certain nervous apparatus, and that, greatly obscured as it is by numerous and involved conditions, a general relation may be traced between the size³ of this apparatus and the quantity of mental action as measured by its results."

Medicine has made no greater contribution to science than by emphasizing the importance of those facts which demonstrate the truth of Draper's statement, that there can be no psychology which is not founded on anatomy and physiology, and also that many of the problems of human psychology will become intelligible only by comparison with the facts deduced from the study of comparative psychology. The truth of this statement needs no demonstration. Structure and function are correlative terms, although in the history of psychology there have been periods when their close interdependence was doubted.

The term physiological psychology may be regarded as an unfortunate survival, for it implies an attempt to explain psychological phenomena in ways which are neither in accord with physiological laws nor directly related to them.

There exists a very close relationship between the anatomical development of the higher brain centres and their physiological expression of function. It is proposed to consider this relationship in its two-fold aspect. First, from the standpoint of phylogeny, and, secondly, but very briefly, in its ontogenetic importance.

The higher brain centres are developed from the telencephalon or secondary fore-brain, which reaches its greatest development in the adult life of the higher mammalia. The telencephalon is an outgrowth from the prosencephalon, or primary fore-brain, and is made up of elements from which develop the corpora striata, rhinencephalon and the pallium. The last may be defined as the portions of the walls of the secondary cerebral vesicle which are neither included in the olfactory tract nor in the basal ganglia.

In the cyclostomata and teleostei, the latter represented by the ordinary bony fish, we find the simplest form of the pallium. It

³The use here of the word size is unfortunate. Spencer explains at considerable length that complexity of structure, far more than size, is the essential point.

is, in fact, a persistence of the pure embryonal type, consisting of a single layer of epithelial cells, here and there thickened by glia. This structure may be said to represent the beginning of the cortex, and this type reappears in the human foetus. In the selachians, amphibians, reptiles, birds and mammals, this roof contains nervous tissue.

It is essential to examine these structural and functional differences more in detail, and to attempt by a careful comparison between the brain of a vertebrate without a cortex with the higher vertebrate brain, which has a fully developed one, to see if it is possible to define with greater exactness the psychological importance of the higher brain centres. Little has so far been done in this line of study, and doubtless in the future many valuable facts will be brought to light by investigations of this kind.

One of the brains which has been most studied and which does not possess a cortex containing nervous tissue, is that of the trout. As far as functional activity is concerned, this cortex may be practically disregarded, as it consists simply of epithelial cells. When we compare the lower brain centres of the trout with those of the higher vertebrates, it is seen that these centres are relatively larger in the fish. The size of the roof of the mesencephalon is very conspicuous. The magnitude of this portion of the trout's brain is not only interesting from a comparative anatomical standpoint, but it also throws some light upon its functions as a centre. Here the optic nerve ends, and here, also, are found fibres which connect this centre with the cerebellum, the medulla and the spinal cord. A system of fibres is also found which connects different parts of the roof of the mesencephalon, supplying an association apparatus which may, to some extent, be regarded as taking the place of an intracortical association system.

We also find other connections of importance, but the significance of the connections of the mesencephalon with the diencephalon is not so well understood. In this region in the trout, as in the higher vertebrates, we meet with a series of ganglia, as well as nervous tracts, the significance of which is not known. But it is not at all improbable that the anatomy and physiology of the diencephalon, as well as of the higher brain centres, will be better understood by studying the results obtained from careful comparative investigations.

The theory which was long ago advanced concerning the functions of the optic thalamus in man, namely, that to a certain extent it was independent of the higher centres, receives some confirmation from the consideration of its anatomical relations. Until the anatomical relations of the cortex to the thalamus are definitely known in detail it will not be possible to accurately determine many of the functions of the higher brain centres. The knowledge of the physiology of the diencephalon as well depends to a considerable extent upon the settlement of its structural relations.

In animals with a fully developed cortex, the thalamus, when considered functionally as well as from an anatomical standpoint, may be looked upon as an intermediate centre, interposed between the cortex on one side and lower centres on the other. Even in animals without a cortex, the connections of the diencephalon and mesencephalon with the lower centres are very complicated.

Not only, as has been stated, is the mesencephalon itself relatively larger than the corresponding portion of the brain of the higher vertebrates, but the connections with other tracts of the cerebro-spinal system are correspondingly greater. It is also apparent that the absence of the cortex is replaced by the relatively greater development of this centre and its connections. This is a significant fact, and may be made the starting point for investigations of great importance.

If an attempt is made to correlate the physiological function with the structural conditions of the trout's brain, it will be seen that sense impressions, such as sight and smell, may be transferred from the point of reception to brain centres, where they may be again transferred to other tracts, which are in connection with other more remote centres. It is also evident that a possibility of the association of one sense with another is anatomically possible, and although there is no cortex, an association apparatus of really great complexity exists. As far as is known, there is no reason why sense impressions may not be stored in these lower centres, thus constituting what is called memory. And not only that, but there is no valid reason for supposing that the brain of the trout is structurally unfitted for the performance of psychological acts of some importance.

One example will be sufficient to demonstrate what is meant.

The trout sees the red color of the artificial fly used by the fisherman. In other words, the *impression* of red formed upon the retina is conducted to the roof of the mesencephalon by the optic tract and there becomes an *idea*. The terms *impression* and *idea* are introduced with the same significance and limitations in which they were first used by Hume.

It is not altogether improbable that the power of receptivity of the nervous apparatus of the mesencephalic roof may be increased by the action of organic stimuli, such as those comprehended in the complex phenomenon called hunger. The various sensations of this complex phenomenon are conveyed to the central nervous apparatus by the sympathetic nervous system, where they may so awaken the latent receptivity of the nervous elements that the impression of red becomes an idea in the sense to which reference has already been made. The derived impulse, as it may be called in the absence of a better term, or the resultant of the association of the ideas "red" and "hunger," may be transferred to the various lower centres in the cerebellum, medulla and cord, and the result may be the spring of the trout toward the fly. The exact method of the transference and association of the primary ideas and the origin of the derived impulse is not the point to be emphasized, but attention is called to the anatomical complexity of the association apparatus even in the fish, and the correlated complexity of function. The assertion that the cortex is not essential for all degrees of memory is a theory which clinical experience does not altogether discredit.

As is now known, there is a considerable break in structural continuity in passing from the simple epithelial form of the trout's pallium to the comparatively simple, yet when considered by itself, really complex structural conditions of the amphibian mantle. In the amphibian brain, which, as Edinger has shown, closely resembles the mammalian embryonic brain, two distinct layers may, for the first time, be distinguished in the pallium: an outer layer, which contains very few cells, and an inner layer, which is particularly rich in cellular elements. It is interesting to note that Fulliquet first showed in protopterus, a species of mud fish, a point in the ventral portion of the pallium which was plainly connected with the inner cell layer. From this discovery dates the beginning of the study of the phylogeny of the cortex.

Viewed from this standpoint, the brain of the amphibia is interesting, but less understood than the reptilian brain, which has been studied by Meyer, Herrick, Brill, P. and S. Ramon y Cajal, and Edinger.

S. Ramon y Cajal first showed that the reptilian cortex contains essentially the same elements as the mammalian, but the arrangement was simpler and the number of individual elements less.

If we study the reptilian cortex more in detail, we find it composed of cells and fibres arranged in a certain definite way. The single elements are to be seen in the amphibian brain, but they are considerably fewer in number and less regularly arranged. In the reptilian cortex we find pyramidal cells, whose axis cylinders form a layer of varying thickness. A small number of these cells send their dendrites to the periphery of the molecular layer, branching many times before they end free. Some of the dendrites of these cells break up into numerous branches soon after their origin, but others form a thick network in the molecular layer which rests upon the cell layer, and into this region also penetrate fibres from other parts of the nervous system.

The tangential fibres which occur in the cortex of the mammalia are also present in considerable number and serve to unite the different cortical areas. Certainly in reptiles, and not improbably in the amphibia, we find a more or less complicated intra-cortical association apparatus. This is a most significant fact in its relation to the problems presented by comparative psychology. Even in this type of cerebral development, relatively simple as compared with the complexity of the cortex of even the lowest type of mammals, there exists an arrangement of cells and fibres which affords manifold possibilities as an association centre. As Edinger has shown, the distribution of this cortex is also psychologically of importance.

The cortical areas are connected with the olfactory tract, and are, phylogenetically, the oldest tracts which connect the cortex with the lower centres. The exact significance of this fact demands further study and offers a large field for investigation. Here in its simplest form is presented the anatomical relation of the higher and lower brain centres, a relation which is practically not understood in the interpretation of function, but it is one which it is possible to determine.

The problem may be briefly stated as follows: Is it, or is it not, psychologically important that by the appearance of the cortex certain functions are made more complex, and if so, in what manner? Does the cortex simply add to the complexity of the association apparatus? Does it add to the possibilities for the reception and storing away of sense impressions? And finally, does it permit the exercise of functions which cannot be justly compared with those of the lower brain centres? By carefully studying the functional differences of the brain of the trout and the snake, keeping in mind the possibilities presented by the difference of anatomical structure, valuable psychological data will be obtained.

The next centre in the cortex to be connected with the lower brain centres is the centre for sight, and that connection first appears in the brain of the bird. It is unnecessary to repeat in detail the facts which have so far been ascertained in connection with the optic centre as seen in birds; nor is it even necessary to repeat the attempts which have been successfully made to homologize the tracts connected with this centre in birds with the tracts connected with the optic centre in the human brain. It is sufficient to simply call attention to the appearance of this cortical centre and its connection with other centres.

The importance of a complicated optic centre for birds is evident when the bird's dependence on sight is considered, but it is not at all understood how the sight of fish is functionally different from that of birds. In the former, remarkably keen or sharp vision is present, without any cortical connections; in the latter the vision is also very acute, but the qualitative difference is not yet definable. Probably the difference is not one of degree only.

In studying the development of the higher brain centres in the mammalia, it is important to note, as has already been suggested, that the lower brain centres have undergone a process of retrogression, and it is not improbable that functionally, as well as structurally, the importance of the lower brain centres has diminished. The corpora striata in the higher vertebrates are relatively smaller than in the fish; on the other hand, we find the simple epithelial layer which forms the pallium in the fish, in the mammalia is represented by a structure of great complexity. The structural gradations which exist between the cortex of the

bird and the cortex of the lower mammals have not yet been carefully studied, so that no generalizations of importance can be deduced from the few facts which are known.

It has already been noted that the starting point of the cortex in the mammalia corresponds to the simple epithelial layer of the fish; but at a very early period in the former, nerve cells and fibres, as well as the neuroglia elements, are added to the epithelial structure. The development of the mammalian cortex is but imperfectly understood. No consecutive study of its early development has yet been made, so that it is necessary to look upon many of the views relating to the development of the mammalian cortex as hypotheses rather than facts. Little has been added to the discoveries of Kölliker and His. Kölliker showed in the brain of the rabbit that part of the cerebral vesicle which forms the cortex is composed of elongated cells arranged radially. At first, the cellular layer is divided into two divisions: an outer, which represents the gray substance, and an inner, from which the white substance is developed. This is the first disposition of the cellular elements. Later, three divisions may be noticed in the outer layer, an outer and an inner layer, which contain very few cells, and a middle layer, which is rich in cellular elements. Kölliker thinks that in the human brain the same arrangement of elements is to be found, and this arrangement is not improbably similar for all the mammalia. But many of the views relating to the development of the human cortex are simply inferences drawn from observations on the smaller mammalian brains. Reference is made to the ontogeny of the mammalian cortex, simply to show how the general characteristics of a certain structural type are common to all the vertebrates. During the development of the human cortex many structural conditions corresponding to those seen in the adult brains of the lower vertebrates may be noted. Few morphological problems present themselves that more forcibly recall the truth of the closing line of Darwin's *Descent of Man*—"Man still bears in his bodily frame the indelible stamp of his lowly origin."

Reference will only be made to those facts in the structure of the mammalian cortex which have what may be termed a more immediate psychological importance. The external conformation of the cortex will not be considered for two reasons: first,

because the subject is too large a one to treat of even in a limited way; and, second, because the external conformation of the cortex is only of secondary importance. The external form of the cortex does give, but only in a general way, some evidence of the complexity of the internal structural conditions. This fact was at one time given undue prominence, and although the usefulness of this line of study is not to be underestimated, still it should be kept in mind that the essential point relating to the production of psychological phenomena is the arrangement of nerve cells and fibres.

As has been already pointed out, the development of the mammalian cortex is imperfectly understood. Most of the views regarding both its phylogeny and ontogeny are conflicting, and its history, as described at present, is disconnected. Many important facts will doubtless be brought to light by the comparison of the cortex of the lower mammalia with the cortex of the higher apes and of man.

The following structural characteristics may be considered typical of the adult mammalian cortex. Cajal has shown that four layers are present in the cortex of all the mammalia. The first, or most superficial layer, is the molecular layer, then two layers of pyramidal cells, small and large, and finally the layers of polymorphous cells.

I. In the molecular layer are to be found three types of cells: 1st, fusiform cells, whose longest diameter is in a horizontal direction. These cells give rise to two protoplasmic prolongations from their opposite poles. The terminal filaments of the prolongations finally end in the most superficial part of this layer; 2d, the triangular cells, and 3d, polygonal cells. The physiological significance of the individual elements is not known, nor is it definitely known how constantly each element recurs in the cortices of different animals.

The fibres found in the molecular layer are derived from three sources: they are either, first, the axis cylinder prolongations of the cells of the molecular layer; secondly, prolongations from the cells in the pyramidal layers, or, thirdly, they come from more remote portions of the nervous system.

II. In the second layer are found the pyramidal cells. The pyramidal cell is found in all vertebrates above and including the

amphibians. In the fish, it is said the pyramidal cell does not exist; possibly its prototype may yet be found. It is not essential for present purposes to describe the pyramidal cell in detail with its various processes. In the lower vertebrates the protoplasmic expansions of this cell as compared with those in the higher vertebrates are greatly diminished in number and probably in length. In the batrachians the ascending protoplasmic process ends with the terminal branching, but no lateral branches are given off from the main stem. In reptiles the basilar expansions are reduced to one prolongation, and the termination of the ascending branch is as simple as it is in the batrachians.

III. In the human cortex at the time of birth, and for a considerable period afterwards, the protoplasmic expansions given off from the base are very short and have few branches. It is probable that the growth of these prolongations continues even to adult life. It is said that in imbeciles a reversion to the simpler type of this cell has been observed, with a corresponding decrease of the protoplasmic processes. These may be considered as the fundamental elements of the association apparatus. According to Cajal, mental activity stimulates the development of these processes and so increases the complexity of the system of nerve collaterals, not only by strengthening the formation of the associations already existing between certain cell groups, but by actually forming new connections by the expansion of the collaterals. It is certainly an ingenious theory of Cajal that he offers this anatomical explanation for cases of atavism or hereditary talent, depending upon the *non-transmission* or *transmission* of these new connections. Considered biologically, the theory presents most serious objections. Although the fundamental truth of John Morley's statement is still true, that "genius must always remain an inexplicable gift," it is not too much to say that even now the mechanism of the apparatus by which it expresses itself has been studied with gratifying results. It is strictly in accordance with the deductions made from anatomical facts to say that the number and extent of the protoplasmic branches of the pyramidal cells are directly related to mental activity. The belief that the study of the morphology of the pyramidal cell alone is all that is essential in the comprehension of the anatomical conditions upon which thought depends is absurd.

IV. The fourth layer. Polymorphous cells. Here are to be found two distinct types of cells, the so-called sensory or association cells of Golgi, and, secondly, Martinotti's cells, characterized by an ascending axis cylinder. The fibres to be found in the cortex are classified under four groups: 1st, the projection fibres; 2d, commissural fibres; 3d, association fibres; in men or the higher mammalia these fibres form the chief part of the white substance of the hemispheres; 4th, the centripetal fibres, which represent probably the termination of the sensory fibres, or at least the cortico-thalamic neurons. In reptiles, as well as the mammalia, many of these fibres may be traced through the gray substance to the molecular layer. This is a significant fact, showing that very early in the animal series this layer has assumed considerable importance. In considering the mammalian cortex as a whole, it is impossible to say that it possesses among its elements any one that is characteristic of its functional importance. This is true both of the cells and the fibres, as well as their arrangement.

As yet nothing distinctive of increased psychical activity has been discovered in the minute structure of the cell. The works of Kölliker, His, Waldeyer and Van Gehuchten have shown that it is impossible to attribute any great psychological importance to single elements. It is certainly unfortunate that the pyramidal cell has been called "the psychical cell." This cell does not exist, as has already been stated, in the fish, but it cannot be doubted that the fish possesses some degree of intelligence, although this has been denied. The pyramidal cells doubtless have some relation directly or indirectly to the production of thought, but it is not yet possible to so define their function as to be justified in calling them psychical. Only in a few instances may it be said that the volume of a cell is proportional to its functional development. The reverse is often true. Only in a few instances does the volume of a cell bear any proportion to the size of the animal, as, for example, the chicken has a larger pyramidal cell than the sparrow, but no functional or even structural superiority may be inferred from this. Neither can inferences be drawn from the arrangement of the cytoplasmic constituents. The question whether certain cells give rise to some specific form of energy is still under debate, and is probably true

only in a limited degree. The limitations cannot yet be defined. Neither is the theory tenable to assume that the extent of the interval between the pyramidal cells in different animals may have some psychological importance. Leaving the consideration of the histological elements, it may also be said that it is not possible, except in a general way, to infer the psychological possibilities simply from the arrangement of the cortical centres. In man the association centres reach their greatest development. Flechsig's statement that they disappear entirely in the lower mammalia must be considered debatable. In the higher apes the association centres reach a development equal to the projection centres.

These few facts are really all that is known concerning the phylogeny of the cortical areas. If the endeavor is made to define the exact structural conditions upon which the functional superiority of the human brain rests, it may be said that only two facts are characteristic of increased functional activity: 1st, the greater development of the protoplasmic processes of the cells, and 2d, the complexity of the association apparatus as a whole.

It is not possible to refer to Cajal's theory of the psychological importance of the neuroglia, except to say that whether it is true or not, it rests upon a series of assumptions relating to the structure of the neuroglia, the truth of which has not yet been demonstrated.

When considered from a phylogenetic standpoint, it is seen that the structure of the single elements composing the higher brain centres as we ascend from the lower to the higher vertebrates, as well as the relation of these elements to each other, tends towards a gradually increasing complexity. This must be admitted as a fundamental postulate, and the truth of which depends solely upon recognized anatomical facts. If this axiom is kept in mind, the vagaries of certain histo-psychological theories become so apparent that they may be passed over without further notice. Even a cursory examination of the phylogenetic facts shows that it is unnecessary to attribute to certain nerve cells some specific form of action to account for increased psychological function. To give undue prominence to the supposed specificity of certain cells, such as the ganglion cells about the calcaric fissure, is to ignore the relative importance of other anatomical facts,

such as the possibilities of associative action between individual cells on the one hand and groups of cells on the other. At present it is neither possible to affirm, nor even deny, with certainty, that certain cells have the property of exhibiting specific forms of energy. The higher cerebral centres must be considered as a complex whole, and if it is eventually demonstrated that the elements of the various cortical areas differ from each other functionally as well as structurally, this fact will only be a subsidiary one in the explanation of functional differences. Beginning with the lowest vertebrate and ascending the scale to the highest type of mammal is found a varying but progressively complex type of cerebral structure, with which is correlated increasing functional activity.

Phylogenetically as well as ontogenetically, the main fact is apparent that the cerebral structure *as a whole* becomes more complex. Upon no other basis than the acceptance of the truth of this axiom can a comparative psychology be safely founded. Unfortunately, the failure to recognize the importance of this fundamental proposition has resulted in the absurd attempts to found a histo-psychology, of which mention has already been made.

Meynert's theory that the higher brain centres may be regarded simply as an apparatus for the reception, arrangement and association of impressions is, with a slight modification, consistent with the acceptance of anatomical facts as they are now known.

The structural relation of the higher and lower brain centres has been made plainer by the study of the phylogenetic history of these centres, and some light has already been thrown upon their relative functional importance. The exact relation these centres bear to the varying degrees of consciousness is not yet determined.

The medical profession has made no greater contribution to science than the impetus it has given to the newer and more rational study of psychological phenomena. It is a matter of some importance that members of this profession have been engaged in the search for facts relating to the parallelism which exists between structural conditions and functional phenomena, while more than one school of philosophy has been guilty of endeavoring to arbitrarily limit the parallelism by so-called facts "evolved from the inner consciousness."

PSYCHOLOGY AND PHYSIOLOGY.¹

By HERBERT NICHOLS.

It is not the purpose of this paper, as to many its title may suggest, to draw sharpening lines of demarkation between psychology and physiology. The unity of all knowledge is to-day so obvious that no man of true instinct is likely to waste time in drawing scholastic limitations between any two sciences. Rather is it my purpose to plead that as near together and even overlapping as physiology and psychology now are in some ways, yet in others they are too widely apart. They overlap in subject-matter; they are too widely apart in points of view, in practical touch and in working support. The wish underlying all that I shall say has everywhere for its burden that the borderland between the two sciences be made clearer for both, and be occupied in more intimate and helpful relations. In this spirit I beg that I may be permitted to range over this common ground, now touching upon general subjects, and again upon specific problems.

For a beginning, it will prove wise to give attention to certain historical considerations. There are some reasons why we may study the historical relations between physiology and psychology with special care. I need not, in this age, remind any one of what the world owes to science. And if, instead, I emphasize a little the contributions which science has received from early studies of the human mind, I shall do so in order to bring to view certain evil inheritances which have crept in and come down to modern science therefrom—this, rather than to magnify the good that has come along with them.

By way of appreciating both the good and the bad, one may begin by realizing the bulk of the subject-matter now belonging

¹ This paper was one of a course of six lectures, on "Modern Psychology and its Bearings," delivered by the author, at John Hopkins University, in March, 1896.

in common to physiology and to psychology. Taking down Foster's latest edition, we find one-half of the entire four volumes, 772 pages out of 1556, devoted to the muscles, nerves and sense organs; and every word of this must now be considered to be the indispensable property alike of both sciences.

Having measured this bulk, we may observe of this great text-book how continually its pages involve psychological assumptions, data and explanations. Scarcely can we read a dozen lines without running upon some "sensation," "perception" or "feeling" "worked in the mind" by some physiological organ, or upon some physiological organ "reacting to" some sort of "mental occurrence." If in a thoughtful mood, one cannot read far without being struck with how impossible it would be to construct a science of physiology without psychological terms and conceptions.

Bearing in mind, therefore, how the bulk of physiology is thus permeated through and through with psychology, got from somewhere, let us now glance at certain events which have influenced the development and dissemination of psychologic science everywhere. Previous to the dawn of modern science the study of the human mind had been a favorite occupation of some of the profoundest men the world has produced. We may to-day reject their conclusions and their methods, but we do ill to neglect their influence upon their times and upon the conceptions inherited from those times. A pretty complete outline of psychologic theory was accomplished by those men. That it was not an entirely sound and successful system is well known. Yet what happened when the epoch of modern science came was something as follows: When the significance of the brain as the basis of mental phenomena became comprehended and the old doctrine of soul faculties was consequently thrown over, the old psychology was not so much thrown over with it as taken up bodily and transferred, good and bad together, to its new physiological basis. It is remarkable, upon examination, how little new psychology was really created in this early transitional epoch, and how few fundamental changes were made in the old. The whole energy of psychologists and of physiologists alike was exhausted in mere readjustment; and we can well imagine that much of this work was clumsily and carelessly done.

At that stage of history, physiology and psychology stood on the same basis of psychologic theory. Soon, however, great events happened that affected our two sciences in markedly different ways. First came the burst of metaphysical speculation which spread through Berkeley, Hume, Kant, Fichte, Schelling, Hegel, Herbert, Schopenhauer, Lotze, etc. Then followed the Darwinian epoch of science, culminating in our present evolutionary theories. The metaphysical epoch affected physiology and general science little; and we find them to-day throughout the enormous volumes of their production, using, for the most part, the same terminology and metaphysical conceptions that prevailed in the middle ages. Both epochs, on the contrary, influenced psychology profoundly. The new flood of metaphysical analysis demonstrated that the ordinary assumptions regarding body and mind are fundamentally inadequate; and post-Darwinian science forced a revolution equally far-reaching regarding their biologic relations. In consequence of all this, much conflict and misunderstanding have arisen between psychology and general science, including physiology. Psychology, finding itself without any adequate working hypothesis, has been forced to consider its fundamental problems in such a manner as gives to its current work precisely that speculative aspect which followers of the more settled sciences above all else abhor. From this so-called "speculation" the other disciplines draw back, declaring that it is wrong in spirit and is not true science.

With these things in mind, we may now approach the crux up to which they have been leading from the first. No class of men have been more zealous in expurgating from their science the false notions which scholasticism and mysticism held of it, than physiologists. But if the physiologists, through a desire to be "soundly conservative," now feel bound to draw back coldly from present psychological work because of its "speculations," we are forced to consider what sort of psychologic conceptions they are to which this conservatism chains their science the more closely. Plainly, they will be those which physiology prevalently now holds, and which have come down to it traditionally from the middle ages; the same "speculative and pseudo-philosophic obfuscations" from which psychologic science has been seeking to free itself for two centuries. It may be that this

Herculean effort of psychology has not yet culminated in entire success; yet the physiologist should well consider whether he is wise in wholly ignoring the residuary influence of two hundred years of profoundest struggle for basal truths which the world has known. Also, he should consider whether his shrinking back into the metaphysical assumptions of mediaeval times is likely to prove essentially the sort of shrinking from "foolish" metaphysical speculation which he, at heart, intends.

We must not be content to view abstractly this danger of tying down modern physiology to these crude and primitive notions of psychology; and we must therefore now press on to witness concrete instances of the harm which such a course already has brought us.

To this end I propose to examine a group of subjects for which the words "visceral sensations," "emotions," "instincts," "sub-conscious processes" and "personality" may, in a measure, prepare the reader, and which, though they may seem, as thus strung together, to have no mutual relationship, yet I shall hope to show they are, in common, beset with a round of false traditions, tangled one with another, in a way fairly exemplifying our subject in hand.

I have spoken of the attitude taken by many scientists against current psychology. Nothing is more common than a certain sort of rank censure of the attempts of modern psychology to grapple with its elementary problems in a way necessitating closer speculation as to the relations of mind to body than physiological text-books have yet been driven to consider. In Dr. Charles Mercier's recent book (1895) on "Sanity and Insanity," we have an example of this, which, from the eminence of the author, and from the unique relationship of his profession, as an alienist, both to psychology and to medicine, serves admirably for our present purpose. In laying down the foundations upon which he is to build his views of insanity, we find this distinguished author declaring as follows (p. 47): "In the first place we must discard altogether the notion that mind can work upon, or influence, or produce changes in the nervous system, or in matter of any kind, however arranged." And, similarly, he "discards" the influence of neural activities on mental activities, going on to object, facetiously, to the idea of "putting beefsteak into a sausage machine and pulling out a sonata"; and to striving to imagine a thing that is "partly an iron bar and partly a smell of paint."

Now, as a matter of fact, precisely what does happen, miraculous and impossible as it may seem to Dr. Mercier, is that we are continually putting beefsteak into our sausage machine and pulling out sonatas and effects of that kind. Nothing but the superstitious traditions of primitive ignorance should blind any sober scientist to this fact. Modern psychology is bravely endeavoring to find how the trick is done, and has, I think, fair chances of success; possibly through giving Dr. Mercier a more correct notion of what a beefsteak really is. Be that as it may, this tirade is an example of my point in hand. For confessing that we do not yet know the ultimate nature of mind or body, I must remind Dr. Mercier that the assumption which he positively and unhesitatingly makes is nothing more or less than a specimen of the crudest metaphysical speculation that has come down to us from scholastic and pre-scholastic times.

I have not space here fully to point out the results of Dr. Mercier's rashness in his own book and in his department of science, interesting as this would be. I shall have occasion later to note a single item. But we can, here and now, compare his method with the magnificent judiciousness of Dr. Foster toward the same subject. Already we have had occasion to speak of the bulk of psychology to be found in Dr. Foster's pages. Yet throughout all his four good-sized volumes I do not find a solitary passage wherein he does not take for granted, and as fundamentally assumed, that mind and body *do* causally interact and "influence" and "produce changes" mutually in each other, all quite as Dr. Mercier declares we must not do. Constantly he speaks of stimulations that "determine" sensations, or "give rise to," or "affect," or "cause changes in" them. Always a causal relation between body and mind is directly involved in the language used. Moreover, it would have been absolutely impossible for him to have written his work on physiology without having taken this for granted. It is all very well for one to carry on an abstract metaphysical argument about the "absolute disjunction" of mind and matter and the "impassable abyss" between the two. But let that same person undertake to carry out his hobby concretely by rewriting Dr. Foster's text-book and he will give up the job very soon. Simply, he could not write a page intelligently *without* making the very assumptions blindly that Dr. Mercier arraigns

the psychologist for striving to make with clear knowledge. The harm which such men as Dr. Mercier—and they are many—do in their science by their own inconsistency, and still more by their denunciations of others for attempting to do what plain common sense demands all science should always do, is, I assert, a concrete example of the evil of which this paper treats.

It is my declaration that physiological text-books are full of scholastic traditions which not alone mislead science from its larger needs, but also mislead her in details and in her practical problems. Let us now examine some of these latter at even closer range. Few things have struck me more forcibly of late than the extraordinarily good psychological work being done among alienists. Yet I continually note in it certain peculiarities. A part of this work is so fresh and suggestive that I know at once it has come from new and direct observations in one of the richest of fields. Another part of it, however, makes me groan with humiliation to think that it must have come, at some time, from some psychological text-book, and that psychology ever could have been so bad. Now in these reports I have been much impressed with the prominent rôle given by these alienists, in their treatises on insanity, to so-called “coenaesthetic” affections, and regarding them you will permit me again to quote from Dr. Mercier, p. 92:

“Roughly speaking, there are four groups of viscera which are sources and receptacles of the nerve currents which correspond with the coenaesthesia. These are the heart, the lungs, the digestive organs, and the genito-urinary organs; and a morbid change occurring in either of these groups imparts a special character to the nervous currents proceeding from it, and is attended by a special modification in the coenaesthesia. Thus the special alterations of consciousness that attend disease of the heart is a tendency to anxiety—to active terror. When the lungs are diseased it is said that there is a tendency for the cast of mind to become joyous, and it is certain that the apprehension of danger and sense of ill-being are often insignificant in comparison with the gravity of the disease. Affections of the bowels are invariably attended by mental depression, by melancholy and wretchedness, more or less acute and profound, and this is the case whether or not the patient recognizes that he suffers from such a disorder. In affections of the genito-urinary apparatus, in addition to the feeling of illness common to all maladies, there is an irritability of temper, and often an hypochondriacal attention to the disease, which is peculiar to disorders of this class.”

Our attention is the more attracted to this from the dominant interest just now being given to visceral feelings, by psychologists, as the basis of our emotions generally. It may be recalled that psychology almost universally has separated mind into three ultimate divisions—Will, Intellect, and Feeling. Until three or four years ago all emotions, and all feelings agreeable and disagreeable, were conceived to be reduced, in accord with this orthodox plan, to pleasure and pain (Sully, 1892). In the last three years no subject of psychology has been more radically overhauled. And the old notion has been so sharply criticized that I think Prof. James voices the best opinion of his day when he declares of the traditional "pain and pleasure" doctrine that "it is one of the most artificial and scholastic untruths that remain to disfigure our science."

While this old doctrine has been thus shaken, no constructive explanations have been offered in its place that have been given anything like common acceptance. One theory, however, has been offered which undoubtedly is full of pertinent suggestion, if not satisfactory throughout. This is the James-Lange theory, which bases emotions on the "reverberatory feelings" which rise from our muscles and viscera during emotional excitement; that is, upon the sensations that come from our muscular activities exercised in *expressing* emotion, and the visceral sensations accompanying these acts. As Prof. James states it, "we do not laugh because we are happy, but are happy because we laugh"; the emotion rises from the visceral and muscular activities, rather than gives rise to them.

Such doctrine, coming from such high authorities, and coincidently with what the alienists tell us about these same visceral occurrences, must of necessity rouse our interest. Wishing to know what our standard physiology has to say regarding visceral sensations, let us turn again to Dr. Foster, IV., p. 282:

"In respect to all structures other than the skin and nerves, to such structures, namely, as muscles, tendons, ligaments, bones, and the viscera generally, there is a large amount of experimental and clinical evidence showing that, so long as they are in normal condition, experimental stimulation of them does not give rise to any distinct change of consciousness; a muscle or a tendon, the intestines, the liver or the heart, may be handled, pinched, cut or cauterized without any pain, or indeed any sensation at all being felt, or any sign given of consciousness being

affected. Nevertheless when the parts are in an abnormal condition even slight stimulation may produce a very marked effect in consciousness. If, for instance, a tendon becomes inflamed, any movement causing a change in the tendon, especially one putting the tendon on a stretch, will affect consciousness and give rise to a sensation. *But the sensation is one of pain, and not of any other kind."*

The impulses which Dr. Foster speaks of as "continually passing upward from the viscera" (p. 283), end, therefore, in pain and in pain only. At once we begin to suspect that, at the very least, there is something quite irreconcilable between this "common sensibility" of Dr. Foster and that of the alienists of the James-Lange school of psychology, and of history. Certainly joy and similar emotions cannot be explained on the basis of visceral sensations if physiology finds the viscera capable alone of pain.

We must examine, therefore, what evidence Dr. Foster offers for his semi-heretical views. All the more shall we be interested in doing this from the fact that, since the writing of Dr. Foster's latest edition, the theory of pain which he deduced, as above, from the old doctrine of "general sensibility," has been laid under wide suspicion and the doctrine of specific pain nerves exalted to strong probability in its place.²

If the coenaesthesia of history is turned into pain by Dr. Foster, and proven to rest on pain nerves by weightily accumulating evidence, not only will the running-aground of this hoary doctrine be interesting evidence of how mediaeval psychology has played mischief with the most learned and cautious physiologists of our day, but also our curiosity will be enlivened to see what may be the influence of the tradition in the psychic theories of Prof. James and of Dr. Mercier.

Of course, Dr. Foster had heard of the doctrine of pain nerves when he wrote his book. But so little heed did he give it that he dismissed it in a single sentence, remarking "that such a special mechanism [as pain nerves] has been preserved, but unused, through whole generations in order that it may once in a while come into use [when we have pain] is in the highest

² See article in *Brain*, p. 1, 1893, and p. 339, 1894, by Dr. Henry Head, of University College Hospital, London. Also articles by Prof. von Frey in *Berichte d. math.-phys. Classe d. Königl. Sach. Gesellschaft der Wissenschaft zu Leipzig*, 1894, pp. 185 and 283; 1895, p. 166.

degree improbable." The incomparable looseness of this remark in the mouth of Dr. Foster becomes apparent when we consider that if constant use be necessary to the preservation of nerves, then he could just as well conceive the pain nerves to be employed with the obscure impulses which he declares are "continually passing upward from the viscera," as should his own basis of these impulses, whatever he conceives that basis to be, and which he has neglected to name. But neglecting this, we will pass on to examine the direct proof which Dr. Foster offers for his peculiar opinions (p. 283):

"We are in a certain obscure way aware of what we may call the general condition of our body. To put an extreme case, if the whole of our abdominal viscera were removed we should be aware of their loss. We should be aware of this through more ways than one. The tactile sensations from the abdominal skin would be in such a case different from the normal, and moreover the muscle sense of the abdominal walls and of all the muscles whose actions bear on the abdomen would make us aware of the void. But beyond all these indirect ways, it is probable that we should in a more or less obscure manner be directly conscious of the loss. It is probable that sensory impulses, not of the character of pain, are continually or from time to time passing upward from the abdominal viscera to the central nervous system. These do not affect our consciousness in such a direct manner as to enable us to examine them psychologically in the same way that we are able to examine special sensations, such as those of sight, or even sensations of pain; nevertheless they do enter, though obscurely, into our consciousness, so that we become aware of any great change in them, and they have been spoken of under the title of 'common' or 'general sensibility.' . . . When they do assume such a magnitude or intensity as to break in upon consciousness, the change of consciousness which they produce is of the kind we call pain," etc., etc.

Now note the confusion! Dr. Foster tells us explicitly that pain is not an exaggeration of pressure nor of temperature sensation (p. 282); that "general sensibility," pressure and temperature sensations are three separate kinds of sensations (p. 283); that "general sensibility," before it becomes "excessive," is "not of the character of pain" (p. 283); and that when it becomes so "excessive" that it breaks in upon consciousness sufficiently for us to become aware of it, then it is pain (p. 284). Surely it is anomalous for an impulse to be of one class of sense quality before it rises above the threshold of consciousness, and of another kind

as soon as it does this. It is anomalous, also, to speak of an impulse becoming "excessive" before it rises above the lower threshold (p. 284). What obfuscation, then, it is to declare that a sensation is not pain while "in consciousness" so obscurely that it has not yet reached "intensity" enough to break in upon consciousness sufficiently for us to be aware of it; and that then it is pain!

Dr. Foster should have unusually strong proof for sensations that are so obscure and that so violate all known analogies. But what becomes of the proof offered by him, when examined closely?—and here rises the point that particularly concerns the subject of our present paper. He offers, first, that this general sensibility has "*been spoken of*" in traditional psychology, and secondly, he offers the purely psychological conjecture that, "to put an extreme case," we should *probably* be directly conscious of the loss of our abdominal viscera if they were wholly removed. If we scrutinize this last point we may note of it, first, that a man is not directly aware of the loss of an amputated limb, but often feels it, after it is gone, precisely as if it were there; thus while Dr. Foster credits "general sensibility" to the limb as much as to the viscera, we are here absolutely certain that the loss of "general sensibility," if such exist, does not make us directly aware of the loss of the limb. Again, it is well known that after the removal by surgery of a kidney, or of other considerable portions of the viscera, one is not directly aware of the loss, not more than we are of their presence commonly and during health. And this, taken with "the large amount of experimental and clinical evidence" cited by Dr. Foster to the effect that experimental stimulation of the normal viscera does not give any sensation save of pain only, and with the well-known fact that pain generally is of itself incapable of giving us knowledge of the parts whence it rises, all this makes extremely doubtful if we should be aware of the loss of the whole viscera *except* through the indirect ways mentioned by the learned author. And finally, the combined facts that pain has now been proven to rise from specific nerves and *not* from "general sensibility," and that there is no reason whatever to believe that these obscure threshold beginnings of pain are anything but obscure and feeble pain, all these facts taken together and in the light of common analogy

with the specific origin of all other sensations, now render it entirely improbable that there is any such thing as "general sensibility" apart from our ordinary senses; rather they show it to be probable that Dr. Foster himself has been misled, in accord with the main thesis of this paper, in attempting to rehabilitate this departing myth of prehistoric physiology, for upon examination it can now be clearly shown that these traditional notions regarding pain and "general sensibility" are but the survived remnants of early, crude metaphysical speculation.

But what, then, of the "visceral feelings" of the alienists and psychologists! The truth is, there is quite another side to all these things, and one which we must consider if we are to find reconciliation for the mingled truth and confusion of tradition. A concrete illustration may help us to this new point of view. Hunger and thirst are commonly given in physiological textbooks as marked and typical examples of "general sensibility" [so in Foster]. On the other hand, impulses to satisfy hunger and thirst have always been set down as instinctive. Now, the feelings of hunger and thirst themselves prompt to the same sort of conduct as these so-called instinctive impulses. Indeed, it seems possible that the same inner core of the psychic happenings which, in the one case, is regarded as a visceral feeling, may be identical with that which, in the other, is named an instinct. What, then, should result if, instead of conceiving the inner core of the feelings of hunger and thirst to be the counterparts of certain visceral currents running *to* the brain, we should turn squarely about and regard them as motor ideas seated congenitally in the brain and let loose *from* it to prompt the creature to specific conduct for getting sustenance? Unquestionably our attitude of investigation of these matters would be revolutionized and a wider horizon would be given to the problem. We should now expect these instincts to be aroused in more than one way—by smell, by sight and often by sound, *as well as* by a condition of the stomach. Moreover, since in cases of instinctive impulses aroused through sight, for example, of an animal at sight of its prey, we should think it ridiculous to seek an explanation of these instincts wholly in the eye, so we should now be led, perhaps, to recognize how faulty it has been for physiologists to seek an explanation of hunger and thirst wholly within the viscera.

Where an instinct is prompted by sight it is said to be aroused through association fibres. Undoubtedly the psychic state in question becomes *associated* with quite different thought-pictures under different conditions, and according to the sources from which it is aroused. Sometimes it is associated with certain conditions of the body, and sometimes with the scenes and events common to conduct for satisfying those conditions. But every tyro of psychology should know that, stripped of these associations, the inner core of these psychic occurrences would be absolutely indistinguishable from each other, and in the one case would no more give us any idea of our viscera (or of their loss, as Dr. Foster suggests would happen from general sensibility) than in the other they would give a wolf an idea of a fine fat sheep, or would give a dog a *sight* of his mistress' kitchen.

Of course the mere turning to this wider view would not, of itself, solve all the mysteries of hunger, nor illumine beyond a shadow all the realms of physiology, of insanity and of emotion. But it would bring light into all these regions. It would enable Dr. Foster to clear up many of the perplexities regarding hunger and thirst which he sets down confusedly in his book. It would enable us certainly to understand how "herbivora and other animals, whose stomachs are commonly more or less full," should yet feel hungry at the sight of food. It would enable us at least to imagine how hunger from an empty stomach may be explained in different ways and yet in conformity with the conclusion that the viscera give no direct sensory currents save of pain from pain nerves, and of muscle-sense from muscular contractions. It *may* be that the mere emptiness of the stomach, or, again, the undue presence of its juices, incite muscular and peristaltic disturbances of such persistency or strength that they force their way, let us guess, to some part of the Rolandic region of the cortex, and thence arouse by association the proper instinctive feeling of hunger, together with their own more immediate muscular feelings. Or in place of muscle-sense, it may be that obscure and feeble pains are commonly the only direct visceral sensations, and these, rising by pain nerves to some yet undiscovered pain centre of the cortex, spread thence by instinctive associations, as we conceived in our foregoing conjecture. Or a continued lack of food may, at times, complicate the

feeling of hunger through the blood; that is, in effects upon the nervous system generally, and similar to those experienced in fainting. Again, all these things may be brought into line with the fact that long-continued hunger may be lessened and apparently satisfied by injection of food into the bowels. Not being a physiologist, I am incapable of saying how these things shall eventually be explained. But of this I am sure, that when physiology shall rise above the traditional psychology of mediaeval times, then will it, and psychiatry and psychology, alike receive enriching inspiration in many fields as a consequence. It is a small matter how hunger be explained—whether as visceral sensation or as instinctive motive—but the collateral issues are momentous. They are momentous in psychology,^{*} and within the sphere of the alienist it must be more profoundly fruitful to his understanding of the maladies which Dr. Mercier treats, to study them as functions of the brain parts which

^{*} Lest it be thought that I have too much emphasized a trifling matter, I may here note that psychologists to-day are being driven into two schools. One, the Kinaesthetic School, inclines to look upon all motor ideas and upon all emotional feelings as *results* of muscular and visceral activities, and to disregard the sensory side of the instincts altogether. The other, the Instinctive, or as it has been more often called the Innervative School, turns all this squarely about and looks upon the cortex as lying in the *primary* road to muscular activity. A dispute can be hardly too much emphasized which thus sets Will, Feeling and Instinct upon such opposite constructions.

As a final word regarding "general sensibility," I remark that, as any one who has examined the physiological text-books of the last three hundred years may have noted, it appears always to have been the custom of these authors to tell all that was definitely known about our "five senses," and then to drop all that was surmised but not definitely known concerning the multitude of our other bodily sensations into the fathomless doctrine of general sensibility. As pressure, touch, heat, cold, muscle and joint sensations have each, in turn, been fished out of the common receptacle, the remainder has as often been left, as of old, disposed of by continuing a name. At the time of Dr. Foster's last writing all had been rescued but pain. And with pain now set on common footing with other sensory processes, it would seem well hereafter for physiology in disposing of hunger, thirst, nausea and such complex processes as are not yet understood, to tell only what is known regarding them, and then to drop the subject without hiding it under a mere word which is sure to deaden research and to mislead in many wide and depending fields of science.

most deeply underlie the foundations of our mental superstructure, than to regard them as the superficial effects of visceral disorders.

When in the beginning of this paper I strung together the phrases "visceral sensations," "emotions," "instincts," "unconscious and sub-conscious processes" and "personality," there was little apparent relationship between them. In the light of our general subject I hope I have now said enough to suggest the cogent relationship of them all, and to enable the reader swiftly to connect the little I have left to say, regarding the last three, with what has gone before. The current notion, common even in science, that instinctive conduct is unconscious conduct, is one of the grossest and most characteristic superstitions that has come down from the past. It reached its climax, in Descartes, with the doctrine that all animals, save man, are absolutely unconscious automata. Gradually this declined into the belief that only the instinctive acts of animals were unconscious, it yet being held that animals lower than man are mainly instinctive, and that man is little, if at all, so. To-day we have got so far as to recognize "that man has more instincts than any other creature." Yet the superstition that instincts are unconscious is still of such subtle influence, that while leading psychologists may assert the contrary in the few perfunctory remarks which they commonly devote to instincts in their text-books, yet they do this in a manner so "rootless and branchless," and so detached from their systematic expositions of will, feeling and intelligence, that it remains true that there is no treatise of psychology extant in which instincts play any fundamental rôle, or one proportional to their biologic and psychologic importance.*

The relation of instincts to attention, to "the motor problem," and, indeed, to the entire functions of mind, is so obviously fundamental to every one who but soberly considers the matter, that I need not dwell upon it here. Also, I have said enough regarding instincts as the fundamental source of explanation of hunger and like phenomena, to make plain that they are of

*This, too, in face of the obvious suggestion that the cortex, the accredited organ of consciousness, is likely to be the seat of congenital traits, and to play a dominant rôle in instinctive processes, proportionally to its size and importance over other ganglia.

practical interest to the physiologist. Yet I cannot better reinforce my accusation of the practical harm done by the ancient superstition that instincts are unattended with consciousness, than by showing its misleading influences in neurology. It is even more important to discover the detailed functions of our cerebral nervous mechanism than to untangle its anatomy. This work must largely depend upon our psychological interpretation of these functions. If we start out with false preconceptions of their psychology we are sure to be misled. The notion that the neural basis of all conscious activities must be "located" in the cortex, that all subcortical activities must be identified with unconscious conduct or processes, and that all unconscious processes must be subcortical, are among the main preconceptions ruling neurology to-day. If these preconceptions are wrong, then research in this field is sure to be greatly delayed; and I believe that these conceptions for the most part are wrong. When one considers the origin, the growth and the functions of the nervous system *as a whole*, then these notions stand out as contradictory of all unprejudiced induction or analysis. If the bulk of scientific opinion is quoted in their favor, yet this is not surprising if we observe that they who give them acceptance suffer from the same traditions as do they by whom the investigations are made. Few scientists have attempted to read the facts they have observed with any wider views. Where they have been forced to do so, the results have been profoundly satisfactory. As example of this, we may note the confusion and darkness that covered the problem of "visual localization" so long as all consciousness was denied to the subcortical parts, and while no distinction was made between the "higher" and "lower" functions of vision; and then contrast this with the present status of this problem, *i.e.* that which takes cognizance of the specifically graded function of the upper and lower areas of the left occipital lobes, of the unilateral and the bilateral activities of the hemispheres, of the thalami, and of the corpora quadrigemina. Throughout the slow genesis of these views, which forms one of the most interesting and instructive developments in the whole great problem of localization, we see the newly observed facts of aphasia and of experimental investigation, slowly and with great difficulty, correcting and fighting against the assumptions which had become

accepted law through no other excuse save those which are the subject of this paper.

From the first, the problem of localization has been aborted by false traditions. At the very outset false notions of the will gave a wrong significance and interpretation to the pioneer localizations made in the Rolandic region. Our emphasis of these as "motor" in turn blinded investigators to the true nature of all the so-called "sensory lobes." Also, as the latest reports show, preconceived notions delayed our understanding of the cerebellum. Similar things happened regarding the histology of the cortex. So long as the motor and sensory functions were supposed to be anatomically separate, it was easy to give the big cells of the rind wholly to the "necessarily powerful muscle innervations." The tradition that the ideational side of mind does not demand equal "power" with the connective, lent itself to this view. But according to the very latest reports there is reason to suspect that the branches of the broadest and most capacious of these cells lead finally upward rather than downward, and that their "greater power" has equal, if not more, reference to associational processes within the cortex, than to direct muscular innervations issuing out of it. All of these latest histological determinations quite keep pace with the newly determined psychologic law that all ideas are motor ideas, and that all associations, both within the cortex and without the cortex, stand on the same plane. And this parallel advancement in the two spheres admirably examples the good that would come were equal regard paid by physiologists to the new psychology, though admittedly not yet wholly satisfactory, as to the old metaphysics which, though hoary with conservative and unsuspected acceptance, yet proves upon examination to be still less satisfactory.

One of the most serviceable tasks that could be performed for our two sciences to-day (and one, I believe, that can only be accomplished by them jointly), would be to clear the air of obfuscating notions regarding "sub-conscious consciousness." Both sciences are becoming filled with obscurities under this head. It is well known how much is made of such processes in many current theories regarding hypnotism, multiple personalities and psychical research. Already we have encountered them

in the realm of physiology, influencing Dr. Foster's theory of pain. A still wider use is made of them in the fields of biology by those men who are penetrating enough to see that a broader hypothesis regarding the relation of mind to body is indispensable for the advancement of *all* science in the near future: for example, by Prof. Lloyd Morgan in his "Comparative Psychology." Into whatever field of "the living sciences" one turns, he finds an incontrollable tendency, at present, to cover up whatever is not understood regarding obscure neural processes, with blind and wordy assumptions of subconscious sensory activities. Our problems of binocular vision, of hearing, of the knee-jerk, and our motor problems generally, are full of this sort of mystery. No one who has not specially examined the subject can suspect how widely and how pretentiously this looseness prevails. A short while ago I listened to a famous professor who, beginning with Prof. Wundt's description of his visual fields of perception and apperception, proceeded as follows:

"We are fully conscious of what we see through the fovea. The outer edges of the retina perceive, but do not apperceive. What they perceive is *in* consciousness, but is not noted. But if things may be *in* consciousness and not noted, then anything, and therefore everything, may be thus in our consciousness though not noted. And therefore the mind of the Absolute and all other minds may be in our mind; and our mind in every other mind; and all minds be one. In which case personality will mean solely the specific process of 'noting' or 'apperceiving'; and 'various personalities' will signify but so many separate 'loci of apperception' within the one Absolute."

This is a beautiful conception and perhaps a true one; yet before it is established much of its vagueness must be dispelled. Before we go further, it is necessary to know definitely, both on the neurological and the psychological side, what "noting" and "perceiving" and "apperceiving" involve. And while seeking this information, it is disastrous in both fields to talk blindly of "unconscious consciousness," and to cover up processes that are not understood with mysterious doctrines that are still less understood.

In view of this pernicious and increasing tendency, it is important that two things be done. First, endeavors should be made experimentally to clear up these obscure processes, and

since this must chiefly be done by anatomical and functional investigations, the work is likely to fall peculiarly to physiologists. And secondly, in this work physiologists must avoid being misled by the use of false psychological language. Let us all remember that it is not necessary to assume that the sensory counterpart of every possible external stimulus (external to the cortex) is directly represented "in consciousness" until it be proven that an unbroken communication from the periphery to the cortex has actually taken place. For example, when it is asserted, as has commonly been done since the day of Berkeley, that "muscle-sense" constitutes the important element in our perceptions of visual depth, let us remember while this may be true or not, that it is not necessarily true just because movements of the eyes facilitate these perceptions. The latest researches, indeed, make it extremely doubtful if muscle *sensations* enter at all into the sensory result. While it is necessary and well proven that currents descend from the cortex to move the eyes, it is not proven that retinal currents, running back to represent in consciousness the muscular contractions so occasioned, either actually occur or would be of the slightest use. The harm of assuming unconscious visceral impulses to explain all cases of hunger we have already discussed. In investigating all such processes, then, let us hereafter, and till we know the truth, speak of them as affecting the cortex and consciousness in some unknown manner; this rather than bolster up an unfounded doctrine which leads on to endless mistakes and adds no real comprehension to our stock of knowledge.

All I have said from the first regarding "visceral sensations," "emotions," "unconscious and conscious instincts," and "unconscious and sub-conscious neural processes," leads up to the brief final word which I still have to say about "personality." Leaving aside all religious questions, and confining our considerations alone to the neural processes involved, regarding no question of to-day is there greater traditional prejudice, in the midst of most obvious contradictions of such views, than now prevail regarding personality. It is said that the problem is beyond practical research and outside of physical analogy. Upon examination this does not appear to be the case. If two Leyden jars be differently charged and then properly connected, they will imme-

diately join in one electric "personality." If two sensory neural cells discharge mutually and unobstructedly into each other, they likewise join into a strictly analogous "personality." The psychic counterparts of similar happenings to this in the cortex and higher brain centres, constitute *our* psychologic personality. The whole problem, in so far as the nervous system is concerned, is one of simultaneously connected and mutually influencing neural activity. If an impulse gets sent in to the cortex, say from the lumbar region, in a way to modify and to participate in what at that instant is going on there, then that impulse will get represented in *our* consciousness. If the impulse does not reach high enough, but stops in some lower and momentarily disconnected ganglia, then it will not get represented in *us*, *i. e.* not in *our* minds.

The question now rises, of these massive split off groupings of subcortical activities which are strictly analogous with those of the cortex, and which perhaps at times are no contemptible rivals of them: are these attended with consciousness of their own or not? Assuredly it would be unwise for science to commit herself precipitately, and without profound consideration of the full depth and breadth of the problem, to the hypothesis that *all* so-called physical processes are conscious processes. To do this would be as unwise, perhaps, as it has already proven to be for her to shut herself within the opposite doctrine. Science is too vast, too precious, and yet far too unknown, to be staked either through rashness or through traditional superstition upon *any* narrow prejudice.

Undoubtedly, also, due heed must be given to religious beliefs. But it is just for this that I most earnestly plead for more strenuous consideration of our problem of personality. I believe in our personal life after death. With many others, I do so solely and wholly on scientific grounds. With them, I am convinced that a full and fearless investigation of the problem will, in time, substantiate this faith and make its reasons clear. Moreover, the time is rapidly stealing upon us wherein it breeds the greatest possible danger to religion to repress and to vilify these investigations. Just enough is becoming known or suggested, inevitably to lead to the most nauseating mystic and abortive results, unless fostered within the antiseptic atmosphere of pure science.

The modern facts of hypnotism, of multiple personalities and of psychic research can not safely be ignored. The worse the hands they are left in, the worse must be the result. This danger on the one side, and, on the other, the encouragement which is prompted from every analogy or rational conclusion which I am able to deduce from psychology, biology and neurology, and, as well, from chemistry and physics, urge imperatively that all science should now unite in earnest reconsideration of the fundamental conceptions of matter and mind, and that among these the problem of personality be given its rightful place.

"Visceral sensations," "insanity," "emotions," "instinct," "personality," "the unconscious," "the sub-conscious," "the conscious," all these processes, I trust, now stand significantly related within the thesis of this paper. Each one of them represents a practical sphere of physiology which remains shrouded in great darkness and misconception by reason of crudely primitive metaphysical notions which have come down to present science uncriticised, and which present science shrinks from properly examining for fear of becoming metaphysically speculative. Nor are these exceptional examples. Practical physiology, and especially practical psychiatry, is full of them. I could as well have selected, to the same end, any other of several similarly related groups of "traditions." I hope, however, that what I have said of these may kindle in you a thoughtful consideration of the proposition, that there is as much need that physiology shall unite now, heartily and generously, with psychology to purge the realm of the latter from primitive scholasticism, as it was, at an earlier date, for her to drive out from her own realm the false notions of physiology, derived in the same manner from the same sources.

CAMBRIDGE, MASS.

PRELIMINARY REPORT, CLINICAL AND PATHOLOGICAL, OF A CASE OF PROGRESSIVE DEMENTIA.

CHARLES K. MILLS, M. D., AND MARY A. SCHIVELY, M. D.

The case under examination presented the following history: The patient, a woman, aged 64 years; married; was always of a nervous, somewhat irritable, temperament, but mentally bright and clever, with linguistic and other accomplishments. After the birth of her first child she had an attack of mania. When about 23 years of age she had an attack of chorea which lasted for several weeks. When 35 years of age, apparently as the result of unusual worry, she became more irritable and her temper was afterwards capricious. For a period of ten years preceding her death she was subject to spells of excitement which almost amounted to transient derangement; but she had no tangible delusions, although she had a tendency to persecutory ideas. About the same time she began to show a decided amnesia for names; this gradually, but surely, increased. She had, however, no motor aphasia, but could converse and write well until within three years of her death. During the third year previous to her death she became so unreasonable that it was almost impossible to live peaceably with her; she having at times outbursts of uncontrollable passion.

During the second year previous to death she had two attacks of what appeared to resemble la grippe, during which time she complained of intense pain in the head and back; from the first of these attacks she recovered, but from the second she did not, the pain in the head being persistent and always referred to the right parietal region; insomnia was marked. General failure of memory was observed about this time and she became half bed-ridden.

During the last eighteen months of her life she was confined to bed continuously. Her chief symptoms during this period

were vertiginous attacks; difficulty in orientating herself; marked amnesia, not only for names, but for recent events. She gradually became feebler mentally, and during the few months preceding death was in a state of decided dementia, with occasional spells of excitement. Her attempts at conversation were childish, and she had numerous transient, unsystematized delusions. An ophthalmoscopic examination made one year previous to death was negative.

There were no bed-sores and no paralysis at any time. The case was one in which the entire fabric of the mind seemed gradually to break up, and step by step with mental failure progressed failure of the physical powers. On November 5th, 1896, she suddenly became comatose and died the next day.

The post-mortem examination was made on November 7th by Dr. Burr and Dr. Kelly. The following pathological conditions were present: The dura was somewhat thickened; the pia arachnoid was opaque. The vessels of the base of the brain were atheromatous; the anterior communicating showed aneurismal dilatation. The pial vessels on the ventral surface of the pons showed miliary aneurisms. Portions from six regions of the cortex were removed and hardened in alcohol; the remainder of the brain was placed in Müller's fluid.

Microscopical examination reveals the following pathological changes: Sections stained with thionin (according to the method of Lenhossek) and by methylene blue (Nissl's method) show internal changes in the neuron. These changes consist in irregular arrangement of the chromophilic particles of the cell body—disappearance of these from some areas and aggregations in others—giving the cell body a vacuolated appearance. The chromophilic particles are absent from, or sparsely scattered through, the cell processes. The nuclear changes consist in absence of large chromophilic particles, while the finer dust-like particles and the normally clear karyoplasm stain irregularly; the nucleolus stains deeply.

External cell changes (as demonstrated by the silver-phosphomolybdate method of Berkley) consist in roughening and deformity, extending in some cases to excavation of the cell corpus. The basilar dendrites show moniliform swellings along their course or present clubbed extremities; in some cells there

is loss of several dendrites. The apical dendrite is roughened and deformed in contour. The axis cylinder remains intact. The long pyramidal cells seem to be most affected by these changes. The Purkinje cells show thickened stems with short stumpy branches in place of the complex feathery dendrites of the normal cell.

The protoplasmic glia cells present a series of transitional changes; the fine mossy granulation appearance of the pseudopodia is lost and varicose swellings appear in their course. Other cells take on an irregular, botryoidal appearance and finally evidences of disintegration are to be observed. Deiters' cells are numerous, both in cerebrum and cerebellum.

The basilar and internal carotid arteries show increase in the number of true endothelial cells and a growth of new connective tissue derived from the endothelium. This growth consists of branching cells, proliferated nuclei and basement substance with areas of atheromatous degeneration. In the posterior communicans the intima, media and adventitia are about equally thickened. The anterior communicans of the left side shows aneurismal dilatation. Thrombi are present in all these vessels.

The pial vessels show stasis, aneurismal dilatations, tortuosity and thickening of their walls, with nuclear proliferation. In all regions there are evidences of extravasated blood in the form of groups of corpuscles and hæmatoidin crystals. The region of miliary aneurisms shows similar changes.

All the cortical vessels are over-distended with blood corpuscles; they are exceedingly irregular and tortuous in their course, and appear to be greatly increased in number. The perivascular lymphatics are distended.

Areas of softening occur in the right ascending parietal region; they consist of a reticulated stroma surrounding a central cavity which contains portions of blood-vessels, blood corpuscles, hæmatoidin crystals and fragments of nerve and neuroglia tissue. Areas of coagulation necrosis are present in the left ascending parietal region.

Medullated fibres of the ascending parietal region, optic chiasm, and of scattered areas in the pons and medulla show different stages of myelin degeneration.

In addition to the methods above referred to, sections were

stained with hæmatoxylin and eosin; with hæmatoxylin, picric acid and fuchsin; and also according to the Weigert-Pal method.

In conclusion, the pathological features of the case may be summarized as follows: 1. Internal and external changes in the neuron; 2. Changes in the protoplasmic glia cells; 3. Changes involving the cortical and pial vessels, also the vessels at the base of the brain; 4. Multiple areas of softening in the ascending parietal region; 5. Myelin degeneration.

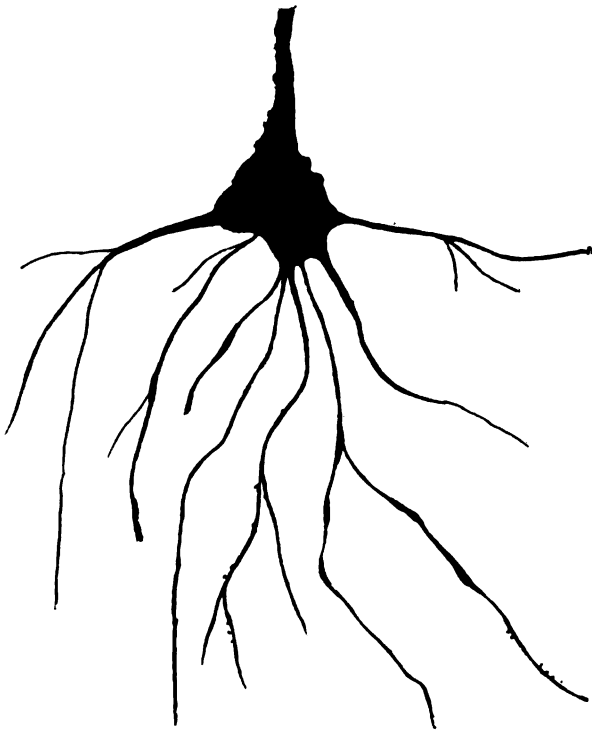


FIG. I.—Long pyramidal cell from the middle occipital convolution, showing roughening of the cell corpus and apical dendrite; moniliform swellings on the basilar dendrites; also loss of gemmulæ.



FIG. II.—Long pyramidal and fusiform cells from the second frontal convolution, showing irregularity in contour; also excavation of the cell corpus; deformity of basilar dendrites; also moniliform swellings of the apical dendrites.

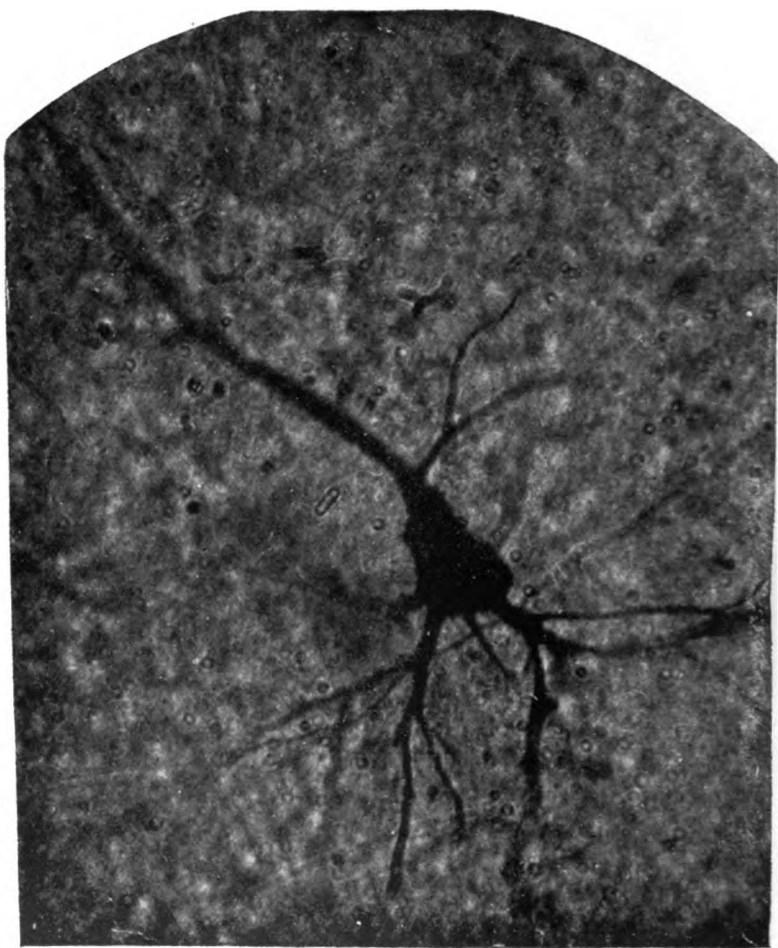


FIG. III.—Photo-micrograph of a long pyramidal cell from the ascending frontal convolution, showing roughening of the cell corpus and of the apical dendrite; also moniliform swellings of some of the basal dendrites.

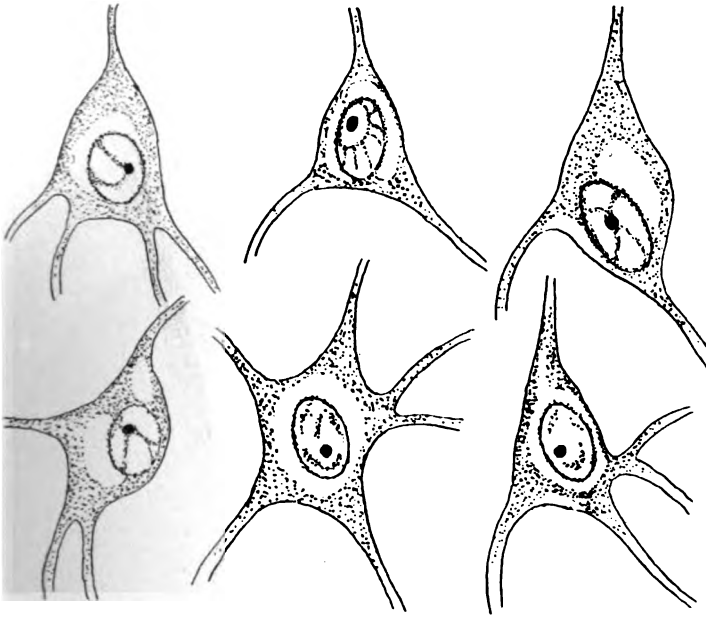


FIG. IV.—Long pyramidal cells from the second frontal convolution, showing vacuolated appearance of the cell body; diminution of chromophilic particles in cell processes; and nuclear changes.

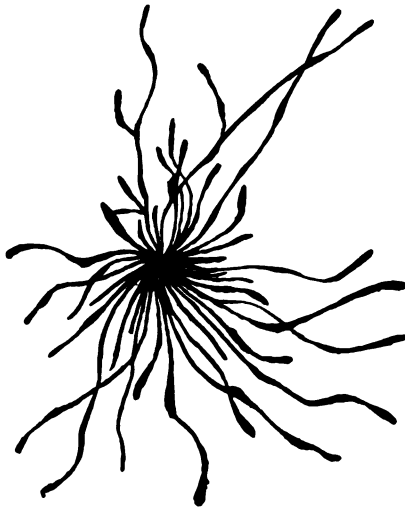


FIG. V.—Protoplasmic glia cell, showing loss of fine mossy granulation, and the presence of varicosities on the pseudopodia.



FIG. VI.—Section from the middle frontal convolution, showing stasis, overdistension of the vessel walls, enlargement of perivascular lymphatic space; also area of softening.



FIG. VII.—Section from the ascending parietal convolution, showing stasis; over-distension of the vessel walls; tortuosity and multiplication of vessels.

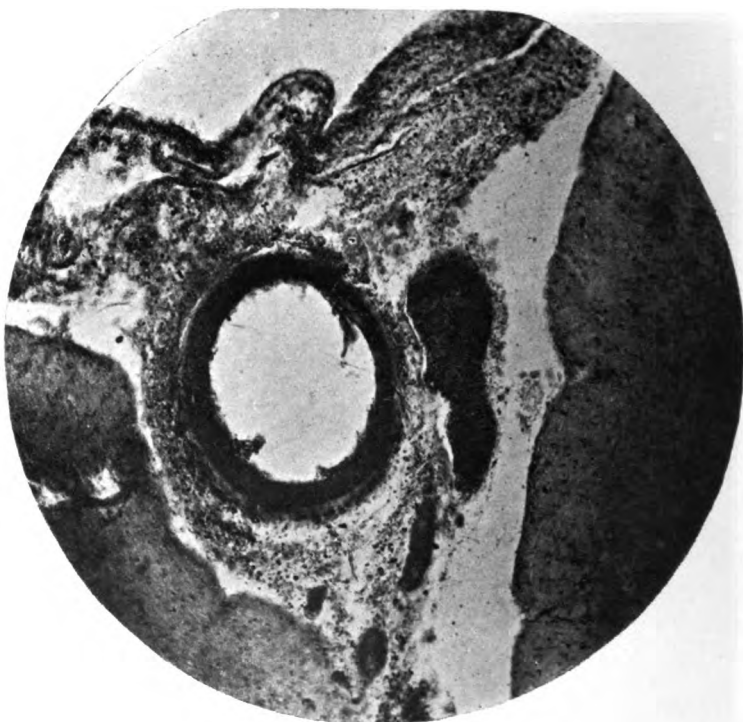


FIG. VIII.—Section in the second temporal region, showing changes in the meninges; thickening of the pia-arachnoid; evidences of extravasated blood; thickening of vessel walls.

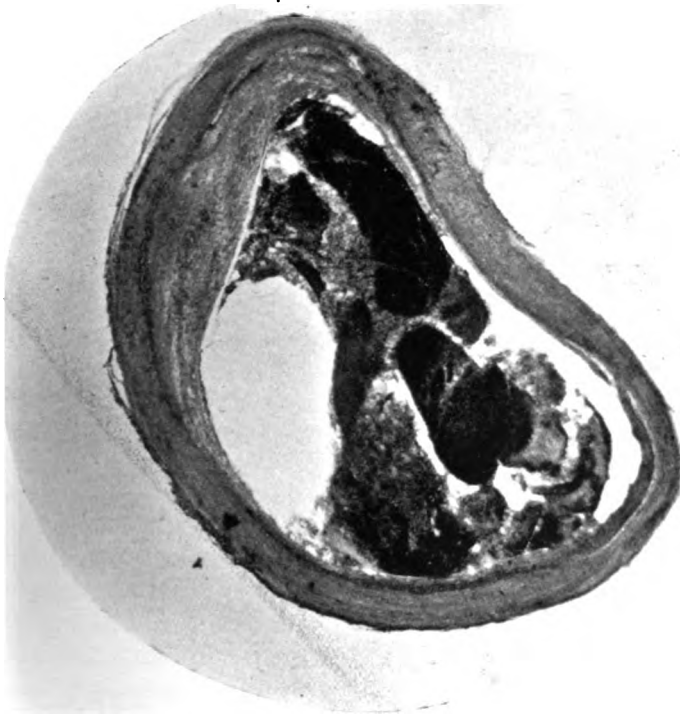


FIG. IX.—Section of basilar artery, showing atheromatous condition of walls; also thrombus.



FIG. X.—Area of softening from the ascending parietal region, containing portions of blood-vessels, blood corpuscles and hæmatoidin crystals.

A PRELIMINARY REPORT UPON THE BACTERIOLOGICAL EXAMINATION OF THE CORTEX AND CEREBRO-SPINAL FLUID IN FORTY-SEVEN CASES OF INSANITY.

By H. A. TOMLINSON, M. D.

Superintendent St. Peter State Hospital, St. Peter, Minn.

This preliminary report of the results obtained from the routine examination of the cortex and cerebro-spinal fluid, bacteriologically, in all cases dying and coming to post-mortem examination in this hospital, is made now because the systematic report which I expected to make has had to be postponed.

These routine examinations were begun in the spring of 1895, after the appearance of a paper by Prof. H. C. Wood, of the University of Pennsylvania, in which he suggested that the form of mental disturbance known as "acute delirious mania" might in some instances be of bacterial origin. Since that time other similar reports have been made, and in the "Medical Record" for August 1, 1896, Dr. W. L. Babcock, of the St. Lawrence Hospital at Ogdensburg, N. Y., reports a case of acute delirium in which he found streptococci and pneumococci in the cerebro-spinal fluid both before and after death, and he was disposed to attribute the inflammatory condition of the brain to the presence of the bacteria as a specific cause.

Our clinical work in this hospital, and the microscopical study of the changes in the cortex, found after death in cases of acute insanity, in relation with the diseased conditions present in the chest cavity and abdominal viscera, have led us to entirely different conclusions; viz., that the presence of micro-organisms in the cerebro-spinal fluid and cortex involved their pre-existence in some other part of the organism, and that their presence during the course of acute mental disturbance was not relational or causative, but associative. The details of this association of bac-

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teria with the changes found in the brain after death, occurring during the course of acute mental disease, form the subject of a paper which I have in course of preparation, and I will confine myself in this paper to the simple relation of the findings from the routine bacteriological examination of the cerebro-spinal fluid and cortex.

Knowing how easily the results obtained by these examinations might be vitiated by the contamination of the fluid during its removal, and also the liability of the brain itself to contamination from handling, special precautions were taken, and the fact that in a certain number of cases the cerebro-spinal fluid and cortex were found to be sterile would indicate that these precautions had been fairly successful.

Altogether forty-seven examinations were made, and the form of mental disturbance present at the time of death varied from simple excitement or depression to stupor or prolonged terminal dementia. It was thought best to make the cultures in every case, without regard to the presence or absence of active mental disturbance, thus giving the results attained a greater significance than they would otherwise have.

The cases examined were as follows:

Case 1. F. A. S. *Acute delirium*. Cause of death, acute nephritis. Streptococci in the cerebro-spinal fluid.

Case 2. N. S. *Acute excitement*. Cause of death, typhoid fever. Typhoid or colon bacillus in the cerebro-spinal fluid. The distinction could not be made.

Case 3. A. H. *Acute stupor*. Cause of death, chronic parenchymatous nephritis. Growth of colon bacillus from the cerebro-spinal fluid.

Case 4. T. H. *Paretic dementia*. No active mental disturbance. Cause of death, pneumonia. Spirillum of Obermeier found in the cerebro-spinal fluid.

Case 5. R. G. *General paralysis*. No active mental disturbance. Cause of death, hypostatic pneumonia. Fraenkel's pneumococcus grown from the cerebro-spinal fluid.

Case 6. S. J. *Paretic dementia*. No active mental disturbance. Cause of death, acute uræmia. Cerebro-spinal fluid sterile.

Case 7. A. O. *General paralysis*. No active mental disturbance. Cause of death, cerebral hemorrhage. Staphylococcus

pyogenes aureus and bacillus pyocyaneus grown from the cerebro-spinal fluid.

Case 8. G. K. *Senile insanity*. No active mental disturbance. Cause of death, chronic interstitial nephritis. Bacillus pyocyaneus grown from the cerebro-spinal fluid.

Case 9. P. L. *Senile insanity*. No active mental disturbance. Cause of death, chronic interstitial nephritis. Fraenkel's pneumococcus grown from the cerebro-spinal fluid; also stained in section in the pituitary body.

Case 10. H. B. *Senile insanity*. No active mental disturbance. Cause of death, pulmonary oedema. Cerebro-spinal fluid and cortex sterile.

Case 11. M. B. *Senile insanity*. No active mental disturbance. Cause of death, cerebral embolism. Pure cultures of Fraenkel's pneumococcus from the cortex and cerebro-spinal fluid.

Case 12. A. R. *Senile insanity*. No active mental disturbance. Cause of death, uræmia. Spirillum of Obermeier found in cerebro-spinal fluid, but it made no growth on culture media.

Case 13. L. N. B. *Senile insanity*. No active mental disturbance. Cause of death, chronic parenchymatous nephritis. Cerebro-spinal fluid and cortex sterile.

Case 14. A. G. *Terminal dementia*. No active mental disturbance. Cause of death, chronic parenchymatous nephritis. Cerebro-spinal fluid contained diplococci which retained their color by Gram, but gave no growth on culture media.

Case 15. E. B. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. Tubercle bacillus in lung cavity was stained, but inoculation of cerebro-spinal fluid on culture media gave no growth.

Case 16. A. J. *Terminal dementia*. No active mental disturbance. Cause of death, interstitial nephritis. Cerebro-spinal fluid and cortex sterile.

Case 17. A. T. *Terminal dementia*. No active mental disturbance. Cause of death, lobar pneumonia. Fraenkel's pneumococcus grown from pericardial fluid, but no bacteria were found in the cortex or cerebro-spinal fluid.

Case 18. C. L. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. Cerebro-spinal fluid sterile.

Case 19. A. J. *Terminal dementia*. Depressed, marked self-depreciation. Suicide by hanging. All organs healthy except the kidneys, which showed chronic interstitial change. The cortex and cerebro-spinal fluid were sterile.

Case 20. O. O. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. Smear preparation of lung tissue showed tubercle bacilli, but there was no growth from the cerebro-spinal fluid.

Case 21. T. M. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. Bacillus tuberculosis stained in fluid from the pleural cavity, but no tubercle bacilli could be found in the cerebro-spinal fluid.

Case 22. W. N. H. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. The colon bacillus and an unknown spirillum were grown from the cerebro-spinal fluid.

Case 23. J. K. *Terminal dementia*. No active mental disturbance. Cause of death, lobar pneumonia. The staphylococcus pyogenes albus was grown from the cerebro-spinal fluid. The urine contained Fraenkel's pneumococcus.

Case 24. A. D. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. Growth of staphylococcus pyogenes albus from the cerebro-spinal fluid. The tubercle bacillus was present also.

Case 25. W. D. *Terminal dementia*. No active mental disturbance. Cause of death, cerebral tumor. Growth of blastomycetes from cerebro-spinal fluid.

Case 26. J. C. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. Smear preparations and sections of a tubercle in the cortex of the uncus showed the tubercle bacillus.

Case 27. N. A. *Terminal dementia*. No active mental disturbance. Cause of death, cerebral syphilis. Blastomycetes were stained in the cerebro-spinal fluid and grown from inoculation of the diseased cortical area. The syphilis bacillus of Van Niessen was also found in this case.

Case 28. O. J. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. Tubercle bacilli in the cerebro-spinal fluid.

Case 29. R. W. *Terminal dementia*. Depressed, with suicidal impulse. Suicide by throwing himself under the cars. Growth of staphylococcus pyogenes albus from the cerebro-spinal fluid. (There was no injury to the head in this case.)

Case 30. R. O. *Terminal dementia*. No active mental disturbance. Cause of death, cerebral tumor. Growth of syphilis bacillus (Van Niessen's) from cerebro-spinal fluid. The same organism was stained in section in cerebral gummata.

Case 31. A. R. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. Fraenkel's pneumococcus grown from the cerebro-spinal fluid. Tubercle bacilli were present in the sputum before death and in the lung tissue after death.

Case 32. J. H. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. Growth of staphylococcus pyogenes albus from the cerebro-spinal fluid.

Case 33. M. N. *Terminal dementia*. No active mental disturbance. Cause of death, sarcomatosis. Blastomycetes were stained in cortical sarcomata and were grown readily from vaginal exudate. No growth from the cerebro-spinal fluid.

Case 34. C. E. *Terminal dementia*. No active mental disturbance. Cause of death, chronic parenchymatous nephritis. Growth of Fraenkel's pneumococcus from the cerebro-spinal fluid.

Case 35. H. I. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. The cerebro-spinal fluid contained Fraenkel's pneumococcus, associated with the bacillus pyocyaneus, and the same bacteria were found in the urine before death.

Case 36. G. P. *Terminal dementia*. No active mental disturbance. Cause of death, lobar pneumonia. Fraenkel's pneumococcus grown from the cerebro-spinal fluid, and was also found in the pericardial and peritoneal fluid and in lung tissue.

Case 37. K. K. *Terminal dementia*. No active mental disturbance. Cause of death, typhoid fever. Colon bacillus grown from the cerebro-spinal fluid.

Case 38. W. S. *Terminal dementia*. Complete stupor for a month before death. Cause of death, lobar pneumonia. The bacillus pyocyaneus and Fraenkel's pneumococcus were grown from the cerebro-spinal fluid.

Case 39. B. K. *Terminal dementia*. Depressed, agitated and confused. Cause of death, chronic parenchymatous nephritis, and there was also a purulent peritonitis. The colon bacillus was grown from the cerebro-spinal fluid and was present in the peritoneal pus.

Case 40. A. C. A. *Terminal dementia*. No active mental disturbance. Cause of death, mammary carcinoma. The bacillus pyocyaneus was grown from the cerebro-spinal fluid, and the same bacillus with *saccharomyces neoformans* was found in tumor and a pleural abscess.

Case 41. F. B. *Terminal dementia*. No active mental disturbance. Cause of death, chronic interstitial nephritis. Fraenkel's pneumococcus grown from the cerebro-spinal fluid.

Case 42. M. B. S. *Terminal dementia*. No active mental disturbance. Cause of death, lobar pneumonia with pleuritic abscess. Fraenkel's pneumococcus, bacillus pyocyaneus, staphylococci and streptococci were grown from the cerebro-spinal fluid.

Case 43. L. S. *Terminal dementia*. Chronic excitement. Cause of death, lobar pneumonia. Fraenkel's pneumococcus found in the cerebro-spinal fluid, and the same organism was grown from the gastric contents during life.

Case 44. H. W. *Terminal dementia*. Noisy and destructive. Cause of death, pleuro-pneumonia. Fraenkel's pneumococcus and the staphylococcus pyogenes aureus were found in the cerebro-spinal fluid, and the latter also in fluid from the pericardial and pleural cavities.

Case 45. A. F. *Terminal dementia*. No active mental disturbance. Cause of death, chronic interstitial nephritis. Streptococci were grown from the cerebro-spinal fluid and also found in the kidney.

Case 46. J. S. *Terminal dementia*. Noisy and destructive. Cause of death, uræmia. The bacillus pyocyaneus was found in the cerebro-spinal fluid.

Case 47. S. P. *Terminal dementia*. No active mental disturbance. Cause of death, pulmonary tuberculosis. The cerebro-spinal fluid contained the tubercle bacillus, as did also the pericardial and peritoneal fluids.

By a reference to the foregoing list it will be noted that three of the cases were recent, two of which were acutely excited and the other stupid. In one case where excitement was present,

streptococci were found, while in one excited case and in one stuporous case the colon bacillus was found.

Four were cases of general paralysis, and in no two of them was the same micro-organism present; yet the mental condition was the same in all of them at the time of death.

There were six cases of senile insanity, manifesting no active form of mental disturbance at the time of death, their condition representing merely different degrees of dementia. In two of these cases the cerebro-spinal fluid was found to be sterile; in two others Fraenkel's pneumococcus was present, while from the other two were grown the bacillus pyocyaneus and the spirillum of Obermeier.

The other thirty-four cases were all of terminal dementia and manifested no active mental disturbance. In seven of these the cerebro-spinal fluid and cortex were sterile; in one an unrecognized diplococcus which stained by Gram was found; while in the balance eight different micro-organisms were found, and in some of the cases two and three different varieties were grown.

Our clinical experience, coupled with the evidence furnished by these cases, would lead to the conclusion that in any case of illness where micro-organisms are present, if the diseased condition is severe or the individual's vitality is low enough to admit of rapid growth and therefore general dissemination of the micro-organism present, it will be found in the cerebro-spinal fluid, but why micro-organisms should be present in the cortex in some and absent in other cases we have not been able to determine, nor the fact that sometimes two or more micro-organisms are present in the bodily organs, but only one of them in the cerebro-spinal fluid. The pneumococcus is more commonly found than any other form of micro-organism, and next to this, staphylococci; but a reference to the mental condition of the patients in whom these bacteria are found shows that the presence of these organisms has no significance in relation to the form of mental disturbance, but does bear a more or less constant relation to the bodily disease present.

In those cases in which the cerebro-spinal fluid and cortex were sterile the bodily disease was of short duration or mild. Of the eight cases in which the cerebro-spinal fluid and cortex were sterile, one was a suicide who was physically in good condition at the time of death. Three were cases of chronic kidney

disease where the patient had been in fairly good physical condition up to a short time before death.

Three were cases of pulmonary tuberculosis in whom the disease ran a comparatively short course, and one was a case of pulmonary oedema coming on in an old man soon after a subdural hemorrhage. In those cases in which the pneumococcus (the micro-organism most constantly present in meningitis) was found, thirteen in all, the clinical picture varied widely, but in all the cases some degree of pulmonary congestion was present. In five of the cases there was an acute lobar pneumonia and in another a hypostatic pneumonia. In three the immediate cause of death was nephritis, while in two it was chronic pulmonary tuberculosis, and in one cerebral embolism. In all of these cases the brain changes were those found in terminal dementia, and in none of them was there an acute process present.

These observations will be continued, but in order to make them more definite, a detailed study is being made as follows:

Cultures are now made from the cortex, cerebro-spinal fluid, pleural fluid, pericardial fluid, abdominal fluid, and from the tissue of that organ which is found most diseased at the time of death. As the result of our observations so far, the conclusion seems warranted that deductions concerning the pathology of insanity, based upon the examination of the brain alone, are likely to be fallible.

NOTE.—Since writing the above, and in discussion with different bacteriologists concerning the examination of the brain in cases of insanity, I find that examinations of the cerebro-spinal fluid and cortex have been confined to cases presenting symptoms which suggested the presence of bacterial infection, and that no account has been taken of the bodily disease, if any, from which the patient may have been or was still suffering, during the existence of the mental disturbance, as a possible place of origin for the micro-organisms found in the cerebro-spinal fluid. This omission, coupled with the fact that the absence of bacteria in other forms of mental disturbance, has, so far as my reading goes, been inferred and not demonstrated, would at least render doubtful the assumption that any form of acute mental disturbance was bacterial in its origin. Beside cerebral abscess, meningitis, both septic and tubercular, presents the same clinical picture, so far as the form of mental disturbance is concerned, but the form of micro-organism found post mortem is by no means constant.

The examinations made since this report was written, conducted with more elaboration and care, steadily tend to confirm the conclusions expressed in the report.

DEMONSTRATION OF VARIOUS TYPES OF CHANGES IN THE GIANT CELLS OF THE PARACENTRAL LOBULE.¹

By ADOLF MEYER, M. D.,
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I would like to give a demonstration of cell changes due to auto-intoxication and to some other causes. I do not think I shall be able to add anything to the intoxication theories or to the aspects of mental disease as they have been offered to-day by Drs. Clarke, Hill and Hurd. I think, though, the remarks of Dr. Van Gieson deserve reiteration, that we must learn to see in the brain an organ analogous in structure and also in its physiological working to other parts of the body. If we then consider how little is known in regard to the toxins that produce changes in other parts of the body, let me say in the skin, I think we shall feel that we are not alone in our relative ignorance of the actual details of the process of auto-intoxication and diseases of metabolism. If we wish to consult with our friends in neurology they will meet with the same difficulties we encounter and on the whole will not be able to show that they have made marked progress beyond what has been attempted in our special field. The result of such a comparison, therefore, is not to me depressing. I think that in medicine in general the auto-intoxication theory is a problem brought most into evidence by our specialty, and surely we have most reason to regret that physiological chemistry and experimental pathology do not help us more to get out of the period of mere speculation. The changes of nerve cells that I wish to demonstrate are all shown in one type of nerve cell, the large pyramidal cells in the fore-brain. I choose that cell because it is the largest and because it is best to study the changes in various forms of

¹ Read at the annual meeting of the Medico-Psychological Association at Baltimore, May 12, 1897.

disease on the same type of cell and on the cell that is most likely to show them without being too sensitive to slight post-mortem changes.

The first case is a marked type of degeneration on the ground of arteriosclerosis, so-called simple pigmentary degeneration, such as is found in senile dementia. The second type is furnished by a case of senile melancholia, partly allied to the forms of pigmentary degeneration, and partly to the lesion after interruption of the nerve process or axone, the reduction in size of the granules, showing moreover the formation of peculiar whirlpools. The third case shows the consequences of a hæmatoma (so-called hemorrhagic pachymeningitis), probably pure mechanical pressure. Finally, two cases which must belong to the general group of intoxications, one observed in a general hospital and manifesting symptoms that led to a diagnosis of meningitis, coming on during florid secondary syphilis; the other case of subacute course and a symptom-complex allied to that of hysterical insanity with choreic and convulsive manifestations, passing over into incoördinated restlessness with complete disorientation. I have not time to enter upon the cases in detail; they will be more fully described in a later publication. The chief thing I have in mind is to take the opportunity of showing you the actual specimens, since they represent important types, and since an inspection of the specimens always furnishes a far better idea than the reproduction of drawings.

I have chosen for demonstration, sections from the paracentral lobule in all of the cases. I show first a normal cell from this region in a rather thin paraffine section. (Fig. 1.) You will see a large cell body of pyramidal shape with a large apical process and smaller lateral dendrites. Near the middle of the cell body you see a large nucleus with nucleolus. The protoplasm shows streaks and granules of a deeply stained substance, so-called Nissl bodies or tigroid substance of Lenhossék. Between them there are plain paths which are stained quite faintly, and which we know to contain the fibrils, probably the most important part of the nerve structure. In some of the cells, in the neighborhood of the nucleus, you would observe a nest of brownish pigment granules. The dendrites stain similarly to the protoplasm, as they have slender streaks of deeply stained matter, besides the

non-stained (fibrillary) substance. The neurite or axone is not stained, as it does not contain any Nissl bodies, but simply fibrils. Passing to the cells in a case of arteriosclerosis you see a number of the cells of normal appearance, others with an exaggerated amount of pigment; and finally, cells which resemble a bag of pigment, with just a small remnant of an apex process into which a shrunken nucleus is pushed. (Fig 2.) Intermediate stages show that the first thing that occurs is a dissolution of granules giving place to pigment. The degenerated cells are frequently in nests together, which would suggest local disorders of nutrition.

In the second case, the patient with senile melancholia, you notice changes somewhat similar to those found in motor cells of the cord and medulla from which the nerve process has been cut off at the periphery. A type of this lesion is seen in the cells of the facial nucleus in a case of facial paralysis due to infiltration of the periosteum of the internal auditory canal, to be described elsewhere.¹ The lesion of the cells consists in a reduction of the size of the granules, or complete decay into dust-like particles, leaving in certain places (usually opposite the axone) areas of an almost homogeneous transparent character, general swelling of the cell body, and usually dislocation of the nucleus to the surface. In our case of melancholia, both paracentral lobules showed lesions of the large pyramidal cells. In all of them the granules were smaller than normal. In part of the protoplasm (Fig. 3) there is in many cells a homogeneous dissolution of the structure as if the details had been washed out; the nucleus frequently seemed distorted and flattened, as if pressed to the wall by this swollen portion. Independent of this, or sometimes along the margin of the swollen area, there appears an accumulation of yellowish pigment. Other cells show practically no "glassy" swelling, but a peculiarity in having the very slender Nissl bodies arranged in striking whirlpools (Fig. 4), such as I have not seen in any normal cells; in fact, in no nerve cell outside of this case, and which to my knowledge are not described anywhere. The nucleus forms in many cells the centre of these vortex formations, and frequently is so covered up by them that the Nissl stain does not give an outline of its

¹ Journal of Experimental Medicine, November, 1897.

capsule. In other cells there is a combination of glassy degeneration with whirlpool formation; in some of them two distinct foci of glassy decay separated by a distinct capsule of slender Nissl bodies. An explanation of this condition is somewhat difficult. It might be intelligible on the supposition that the glassy degeneration of part of the cell body might produce certain distortions of the internal structure in the rest, as is actually seen in many of the cells, and that cells which show these vortex formations would be in a state of recuperation, as is most marked in the large ones. Another thing that must be thought of is, that owing to the smallness and slender form of the granules their grouping is more readily observed than in the normal cells, which may occasionally show a slightly similar condition. Indications of this have been noticed by myself in another case of senile dementia. I would not like to be understood as considering this case as the type of what occurs in senile melancholia, since other experience in this line is not favorable to this view, and since a further examination of the basal ganglia will probably reveal lesions of the projection fibres within the internal capsules.²

In the next case, in which death occurred probably about eight days after the onset of an extensive subdural hemorrhage, the changes in the cells are somewhat different. We are most probably dealing with the effects of lasting pressure through the hæmatoma; perhaps, largely mechanical interference with the metabolism, since in a case of very acute increase of brain pressure, a slight indication of the same alteration was found. It consists (Fig. 5) in the dissolution of the granules into a uniform dust. The cells look in no place as glassy as in the former; there is rather a hazy diffusion of the chromophilous material without any swelling of the cell body; the latter is rather deeply stained and the dendrites are faint, but easily followed for a long distance. In some cells the streaks within the dendrites are slightly preserved, on the whole, better than in the cell body. The nucleus has not undergone marked changes. Within the same brain there are many cells which show advanced pigmentary

² This proved to be true to a limited extent only. A second case examined later, a patient with typical senile melancholia, gave evidence of identically the same changes as those described above. Both will be published in full as soon as the basal ganglia of the second case are examined.

degeneration. The two lesions are not to be confused; the one is an acute mechanical disturbance of metabolism, and the other a chronic senile degeneration. It may be well to say that in this case the cells of the cerebellum were not affected, as they were protected by the tentorium.

Finally, I wish to invite your attention to two cases resembling in their pathological changes those which have been described by Cramer in a case of acute insanity, and quite recently by Hoch in another case of acute insanity in a paper read before the Boston Medico-Psychological Society. One of my cases came to autopsy in the Worcester City Hospital, and I was allowed to get material at the autopsy through the kindness of Dr. F. H. Baker. The patient was admitted there with florid secondary syphilis of the mouth and had been in a delirium with convulsions for several days. The cells which we are studying show almost complete absence of the granules, somewhat similar to what we found in the case of hæmatoma, were it not for the lesion of the nucleus. (Fig. 6.) In several of the nuclei, the nucleolus is somewhat enlarged, although not quite so much as in Dr. Hoch's case, and the nucleus as a whole has a distinctly bluish hue. In the smaller cell it is especially noticeable. In the last case, which began February 1, 1897, with a severe cold, developed into choreiform twitching of the muscles, and finally into attacks of hysterical laughing and crying with one spastic seizure, and finally disorientation and obscuration with marked motor restlessness, and death on April 22, 1897, we found also absence of the granulation in the cell bodies and in most of the dendrites, with hardly any glassy or pigmentary transformation and only slight swelling of the nucleoli. The cell as a whole is distinctly swollen (Fig. 7) and the nucleus slightly dislocated towards the apex process. Only in a few cells the nucleus is pushed to the surface or is devoid of nucleolus. To judge from the general course of both the latter cases and from the lesion in the pyramidal cells, we are most probably dealing with two cases of intoxication, the further details of which will be published later on. The first case had no accompanying disease of the internal organs; the second a beginning of broncho-pneumonia with streptococcus infection. I mention on purpose very little about the changes of the nucleoli, since the studies on that part

are not quite closed and other methods besides Nissl's must be used. I hoped, however, to have been able to draw a short sketch of what we must consider to be the most frequent and typical alterations of the pyramidal cells of the cortex.

As to the possibility of there being artifacts among the types described, I should exclude it, because all the autopsies were done within less than twelve hours after death and the material preserved and worked out with all the needed precautions. There is further, a check in the comparison with cells from other localities, which, as said above, were practically intact where the cause of the change was merely a local one.

DESCRIPTION OF PLATES.

All the preparations were stained with Nissl's methylene blue, partly by myself, partly by Dr. Emma W. Mooers. The drawings were made by Miss Florence Byrnes with a Reichert or Leitz oil-immersion 1-12.

Fig. 1. Normal Betz cell. Thin paraffin section.

Fig. 2. Pigmentary degeneration in arteriosclerotic senile dementia.

Fig. 3. Betz cell from a case of senile melancholia. Dislocation of nucleus and "homogeneous" degeneration of centre of cell and of part of apex process.

Fig. 4. Betz cell from the same case, with peculiar vortex arrangement of the Nissl bodies, a condition present in many of the cells of the type given in Fig. 3.

Fig. 5. Cell with dissolution of most Nissl bodies, due to pressure by hæmatoma. No cloudy swelling.

Fig. 6. Three cells, a cluster from the paracentral lobule of a patient who died in a delirium during secondary syphilis. Dissolution and faintness of Nissl bodies. Glassy swelling of nucleus, with slight violet tinge, diffusely stained, especially in the smallest cell.

Fig. 7. Cloudy swelling with dislocation of the nucleus towards the apex; diffuse stain of the protoplasm and dendrites. Case of fatal "Hysteria gravis."

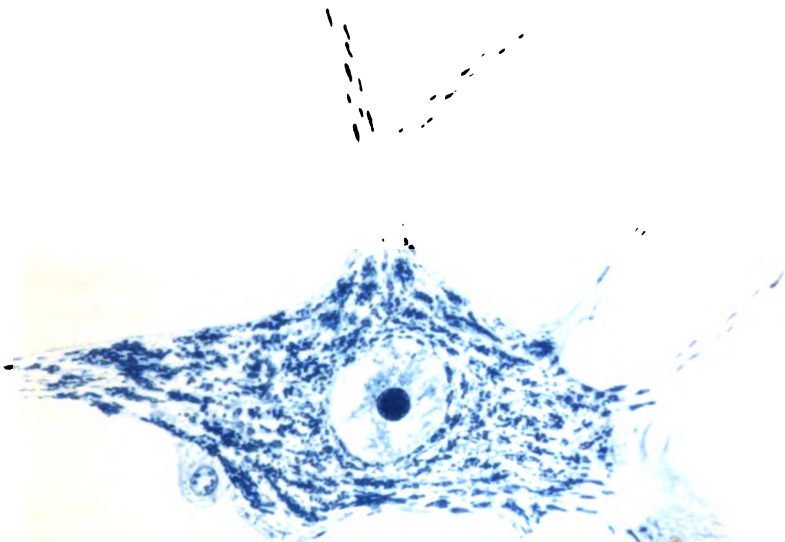


FIG. 1

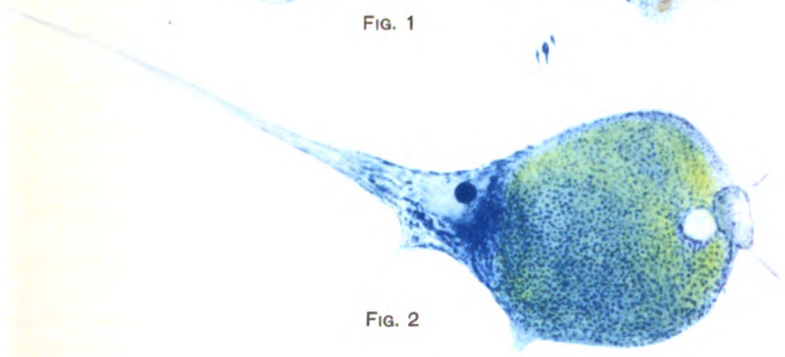


FIG. 2

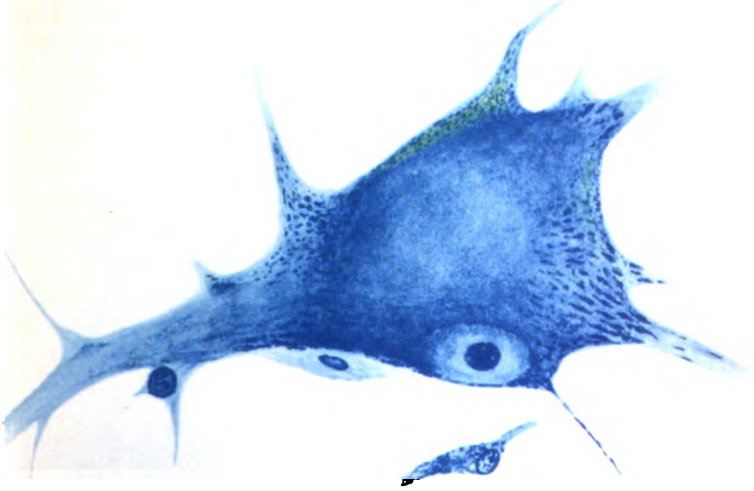


FIG. 3

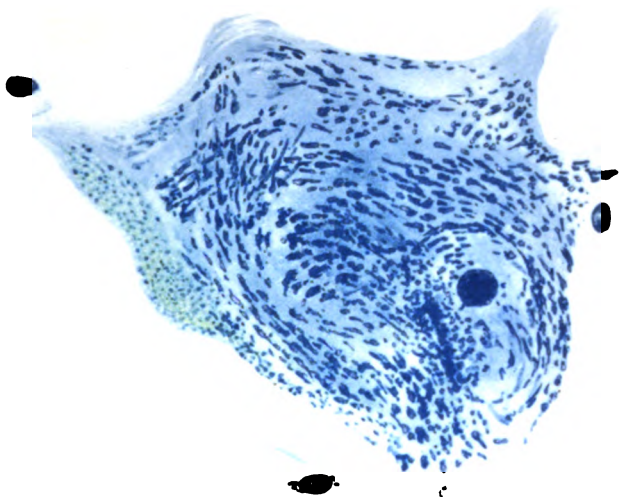


FIG. 4

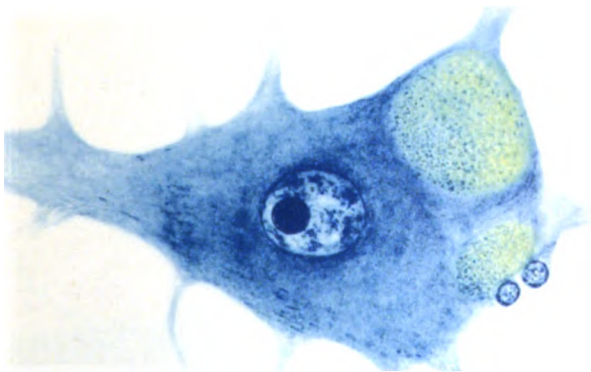


FIG. 5

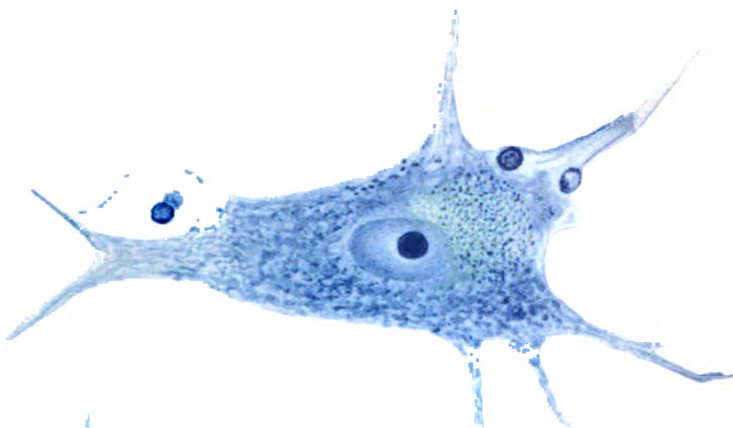


FIG. 6

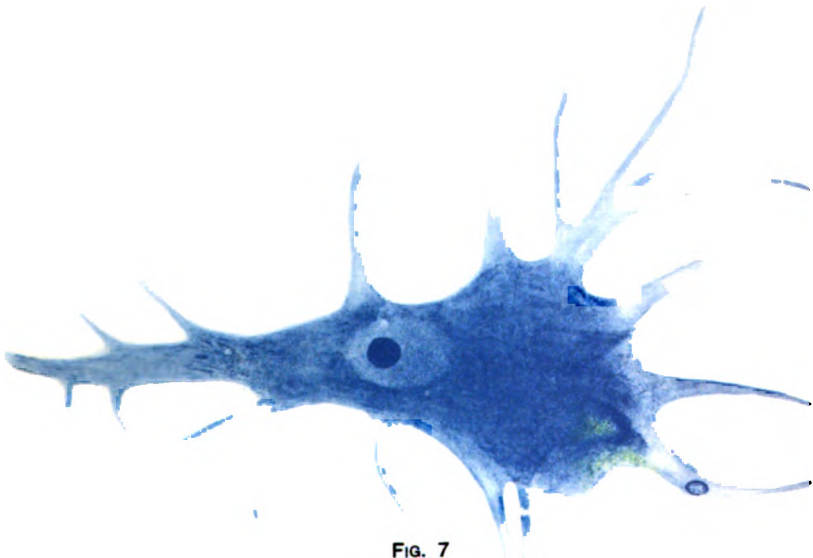
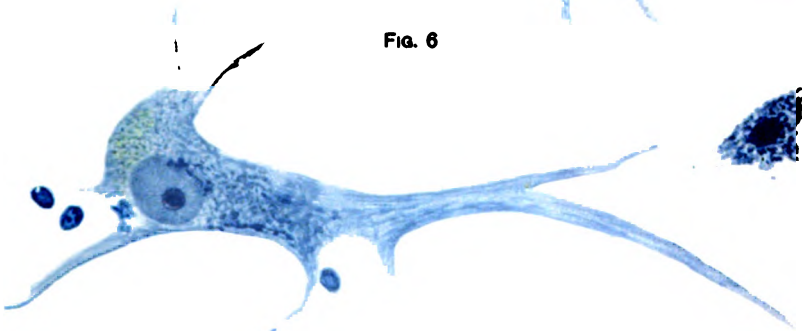


FIG. 7

HEREDITY, A FACTOR IN THE ETIOLOGY OF INSANITY.¹

By HENRY PUTNAM STEARNS, A. M., M. D.,
Superintendent of The Hartford Retreat for the Insane.

Du Bois Raymond says that "the hereditary transmission of acquired characters remains an unintelligible hypothesis which is only deduced from the facts which it attempts to explain."²

Weismann says,³ "It is impossible to imagine any way in which the transmission of changes produced by the direct action of external forces upon the somatic cells can be brought about."

The views implied in these statements appear to differ from those which physicians have long entertained. Indeed, it would not be easy to quote an authority in medicine who does not refer in some form to the transmission of characters which have resulted from external accidental influences upon the organism. Clouston⁴ traces a hereditary influence in insanity in from 30 to 40 per cent. of cases in hospital, and adds that there is a probability of a much higher per cent. He says: "Certainly the tendency to suicide is very hereditary." Mr. J. F. Briscoe,⁵ in a paper read before the Medico-Psychological Association, London, 1896, gave as his opinion, after a careful study of the subject, that 90 per cent. of the insane have a heredity of insanity.

All are familiar with the fact that Darwin made liberal use of the doctrine of hereditary transmission of acquired characters in his work on the *Evolution of Species*.

In view of such an apparent difference of opinion, it may be of interest to examine the subject from the standpoint of the physician with special reference to that change in the character of the brain activities which is the basis of insanity, and as

¹ Read before the British Medical Association in Montreal, 1897.

² Ueber die Uebung, 1881.

³ Essays on Heredity, vol. I.

⁴ Lectures on Mental Diseases.

⁵ The Journal of Mental Disease, New Series, 143.

Weismann appears as one of the foremost representatives of the more recent views, I venture to present, in a brief way, some points of his argument so far as they relate directly to the question at issue.

Heredity, he argues, is a great biological law. Its action covers all forms of life, and its roots reach down into the elements of all living structures. Its effects are, therefore, coeval with the growth of organisms, and should be studied in conjunction with the laws of growth.

All organisms are either unicellular or multicellular. Those embraced in the first class grow to a condition of maturity, and are propagated by a division into two parts. The child cell inherits the characters of the parent cell so perfectly that it cannot be determined which is the older, and this process of division may continue indefinitely. Each organism is a full and completed body, and is endowed with the powers of assimilation, growth, and, in turn, of propagation. Such organisms attain to a degree of immortality. Heredity becomes absolute through the method of formation and growth, and its mode of action is not difficult to understand.

But when we pass into the study of multicellular organisms the problem of heredity becomes more complicated. This is especially the case in the different classes and orders of the vertebrates, where the individual organs and parts have become numerous, highly organized, and the cells of which they are composed have attained great diversity of character. Simple cell division becomes inadequate to even suggest any explanation of the process of hereditary transmission in such organisms; and nature has provided other means through which its laws can operate. This is in nearly all cases by sexual reproduction.

Such an arrangement necessitates the provision of a special order of cell, and also the assumption that at some period in the process of evolution there occurred a division of cells into two varieties: the reproductive, or germ cell, and the somatic cell. The first form of cell is concerned with the preservation of the species, and the second with the preservation of the organism and the discharge of its functions.

The nature of its function would seem to indicate that it is through the germ cell that the force of heredity operates.

Besides, this is the primordial cell, and from it the others originated; it therefore contains the potentiality of a development, under certain conditions, into a complete organism with parental and inherited characters. That is to say, it contains an almost infinite number of infinitesimal elements, each one of which contains a capacity of becoming one of the various kinds of cells, or colonies of cells, which, by multiplication, become members or organs of a complicated organism.

These views do not appear to be unreasonable, and may be accepted in a general way without argument; but an assumption is further made, about which there may be room for doubt. This is, that while the germ cell thus primarily determines the character of the various colonies of the somatic cells by means of its potentiality and continuity of character, the somatic cell has very little influence over the germ cell, and, therefore, that such changes of character as may occur in the latter from the effects of its environment and experiences, cannot be transmitted by the germ cell to a future organism. Weismann says: "Nothing can arise in an organism unless the predisposition to it is pre-existent."* That is, the germ cell is independent in its formation and continuous character of those influences which may produce changes and modify the characters of the somatic cells, except, possibly, in a "very slight" degree.

In trying to test the value of this assumption it becomes necessary to inquire in what way characters of the somatic cells may become modified and changed by influences acting upon them from without the organism.

Acquired characters represent two forms: first, those that depend upon an increase in the normal function of an organ or colony of cells; and, second, those which result from a diminution of function, or a modification in its form of activity. The function itself depends upon and has its representative in an original or inherited organ or member of the general system, and both the quality and quantity of the function will depend upon the character of this physical basis. But with a given quantity of physical basis, the quality of it will determine both the amount and perfectness of the functional product.

For example, a man of very great intellectual capacity, such

* *Essays on Heredity*, vol. I, p. 172.

as a Shakspeare or a Napoleon, may not have a brain of greater weight than the average man, but the inference that certain parts of it are more highly developed; that the cells are more sensitive to impressions and the recording of them; that the connection between the different groups of cells throughout the cortex is more perfect in functioning, thereby giving rise to wider generalizations, would be legitimate. In a great painter and musician those portions of the brain which are the centres of vision and hearing would be composed of a more highly organized structure than the corresponding parts in the average man. In an inverse order, the feeble-minded and idiotic have imperfectly developed physical representatives of their mental faculties, either in quantity or quality, or in both.

Increase in size and in the amount of function of any part or organ of the system arises from the transmission to it of larger measures of organic energy than have before been supplied, and which act upon its elements in the form of stimuli. The effects of such stimuli may become so continuous and powerful in some cases as to result in the development of a greater capacity of function, or in other words, an acquired character.

On the other hand, when the measure of such stimulus to any organ or part is lessened from the effects of exhaustion or from any other cause, there must of necessity result a diminution in the physical elements and also in the function of that organ. In process of time a secondary character may result from such physiological or pathological changes.

The scope of this paper restricts us mainly to a consideration of that form of acquired character which arises from a diminution or modification of normal mental function.

It is not possible accurately to determine how perfectly the elements of the cortex, in the fronto-parietal segment of the brain, recover from the effects of the impairing and destructive processes which occur during an attack of acute insanity. It doubtless varies to some extent in different cases, and depends upon the original recuperative capacity of the brain tissue and the severity and length of time during which the disorder exists. It is, however, a well-established fact, that after the brain has once experienced the continued excitement or depression incident to acute mania or melancholia, there ever afterwards remains, at least, a

tendency which may, from the experiences of trouble, worry and grief, result in one or more additional attacks of disease. Habit of action in a normal condition of the brain becomes a sort of "second nature" with most persons; and much more does a habit in the character of activity, which has become established in a disordered state of the brain, tend to become permanent. In some cases, under a favorable environment, this tendency may not become converted into a reality; in others it does so at the grand climacteric or in old age. In others still there is a frequently changing character in the mental functions characterized by attacks of excitement which may continue for longer or shorter periods, alternating with states of depression. Such persons may live many years with the functions of the general system not greatly impaired.

In the first class of cases the cells of the cortex may have regained their normal anatomical condition to a large extent, and yet still retain a memory or echo of the morbid experience which will impair to some extent their stability of function, and which will never wholly pass away.

In the second class of cases the impairment is more pronounced, and the normal relation of cell to cell has become so far destroyed that the regenerative process never becomes complete. In other words, a secondary and permanent character of functioning has become engrafted on certain elements of the cortex as the result of external accidental causes which may continue indefinitely.

In such cases the cortical function may become partially restored by means of an increase in the anatomy and capacity of those cells which have remained unimpaired. The process may be compared to that which occurs in the circulation of a limb when one of the larger arteries has been ligated or otherwise destroyed. The circulation becomes re-established and is carried on through other anastomosing arteries, the calibre of which becomes larger in process of time from the continued increase of pressure from the general circulation. The original anatomical character of the cortex, however, so far as it relates to the cells, never becomes restored, and its functions remain more or less impaired.

Now, the assumption of Weismann implies that this secondary or acquired character of activity of the cells of the cortex will

have no appreciable influence upon the ovaries, because these have been so thoroughly isolated during both embryonic and the mature life of the organism during innumerable generations, and are so far removed from the direct influence of the somatic cells. In the present supposed case, this means that they are so far removed from the cells of the cortex which have become impaired from the effects of external causes, that they will continue to functionate independently of such influence, so far as relates to the product of their function; or, if influenced at all, the effects must be, to use his own words, "very slight."

Now, if we regard heredity as equivalent to organic memory, and take into consideration the fact that the ovary has been discharging its function from generation to generation during long ages, it seems not unreasonable to conclude that its character of activity and that of its product are not likely to become greatly changed by those influences which may act upon it temporarily from accidental causes. In other words, those tendencies which have become incorporated in its texture during indefinitely long periods of time must be much more potent than any which may arise from such causes as continue in operation only during the single life of an organism. This may undoubtedly be true so far as concerns the general character of the function of the ovary, but the statement does not cover all the physiological factors or activities which properly relate to it.

The error appears to consist in the assumption that the stored up organic energy of the ovary is the only form of energy which can influence the product of its function, but while this does determine the general character of the function, it is not the only form of energy which is essential to the complete and perfect elaboration of the product. This is true in relation to all functioning organs of the general system.

From the physician's standpoint it is hardly necessary to recall the fact of the very intimate anatomical connection existing between the brain centres and all the organs of the body, nor that other no less important fact, that these organs are absolutely dependent on such connection in discharging their function. The efferent system of nerves presents continuous lines of communication along which stimuli of an organic and functional character may be radiated from the brain.

Cope¹ suggests that it is not necessary to assume, as Darwin did, that there exist throughout the body infinitesimal lines or threads, by means of which gemmules are conveyed from the different colonies of somatic cells to the germ plasm, in order to produce such representative modifications as may have occurred from external causes acting on themselves. Such modifications can be produced by currents or waves of nerve force or energy which are constantly passing to the ovaries from the brain centres.

As illustrating this point I may refer to the fact that all physicians of long experience have had more or less opportunity to observe cases in which certain functional disorders, and even profound emotional experiences existing for short periods only, arrest the progress of menstruation, and it may not again appear for some months. An attack of acute insanity produces such an effect in the majority of cases after the first one or two months, and the functional activities of the ovaries may become partially arrested from other less pronounced disturbances of the nervous system.

Now, if the functions of these organs can be thus affected by influences such as cold, shock, overwork, long continued exhaustion, imperfect nutrition, etc., which have their effects primarily and directly upon certain elements of the brain, why may we not argue, from the greater to the less, that there is still more reason to anticipate some effect upon the product of that function? The assumption which provides the basis of heredity, and which seems to be a reasonable one in the light furnished by microscopical studies, is that the germ plasm contains in its highly organized structure a vast number of elements which constitute the representatives of the future organism, not only in its physical parts, such as the contour of the face, the size and color of the eye, etc., but also some of the characteristics of its organic movements, as well as the qualities of the mind. The considerations above formulated seem to indicate an arrangement by means of which the influence of external causes acting upon the brain may be radiated to these elements of the germ plasm and modify their character. But there are some others of an anatomical character which tend to confirm the view that these potential elements of

¹ Primary Factors in Organic Evolution, p. 450.

the germ plasm not only may, but must, be influenced by such causes.

1. It may be affirmed that all acquired characters and changes in the physiological activities of the system, whether physical or mental, are affected primarily and essentially through influences acting on the nervous system. This is the medium through which the personality comes into relation with the external world. Irritations and influences from the environment act primarily upon it; and this, in turn, reacts upon the different organs and members of the general system. But the nervous system, comprising the brain, spinal cord, and nerves, is essentially a unit. The functions of its different parts, however, are of diverse character, and it is accordingly arranged with special reference to the functions to be performed.

Flechsigs calls attention to a distinction between that part of the sensory system of nerves which receives impressions from the external world, and that which is concerned with the functional operations of the body. It is by means of the first kind of sensations, that is, those which come through the special organs of sense and general sensation, that we first become conscious of that which is not ourselves and enter into relations with the world without. The second group of sensory nerves comprises those whose function relates to the physical instincts, such as hunger, thirst, and sexual desire. The fibres of the latter group are found to be the first to become medullated, having connections with the nerves of the cord, medulla, and probably with the internal capsule.

Whether this view is correct, and will be verified in detail in the future, is immaterial. The particular point to which I desire to call attention is that that portion of the sensory system of nerves which has a distinct relation to the ovaries and their product is among the earliest in development, and is related to the primary instincts and profoundest activities of the organism. Provision is, therefore, early made in embryonic life for the future conveyance of radiations of organic energy from the brain to influence them.

2. In the line of this thought Hering, as quoted by Cope, observes: "We notice further on that the process of development of the germs which are destined to attain an independent

existence, exercises a powerful reaction, both on the conscious and unconscious life of the organism. And this is a hint that the organ of germination is in closer and more momentous relations to the other parts, especially to the nervous system, than any other organ. In an inverse ratio the conscious destinies of the whole organism, it is most probable, find a stronger echo in the germinal vesicles than elsewhere."

3. I have, in another connection,^{*} called attention to the fact that the anatomy and physiological activities of the cortical cells differ from those of other somatic cells. Each one arises in an independent, isolated form, and not from another cell, in the ordinary manner of somatic cell-multiplication. "The cortical cell has an individual character and anatomy of its own; that its renewals do not occur by accretion or absorption from the surrounding tissues or blood-vessels directly, but from the influence of forces which act from within the cell itself; that the protoplasmic material of the interior of the cell is constantly elaborating nucleoli which in turn become nuclei, and these afterwards become cells proper, so that the cell never dies except from the effects of disease. Its characteristic form, its angles, projections and dendrites appear to be renewed from time to time, while its individual anatomy remains unchanged."

These are the cells upon which the influences of experience and environment, of whatever nature they may be, act primarily and directly, and no secondary character can arise in connection with any part or organ of the system, except from such influences as have first affected them, and have also been radiated by them to such part or organ.

It follows that when the energizing capacity of these cells has become much impaired from the effects of any cause whatever, there must result some corresponding effects in those organs and the product of their function, which are under their influence and are also dependent upon it when in a normal state of activity. But Weismann claims that this influence must be "very slight." "Very slight" is a very indefinite expression when used in such a connection. Be it little or much, however, it is sufficient, when the cortex is in certain conditions, to arrest the progress of menstruation, and to hold this

^{*}The Physical Basis of Thought (Lectures on Mental Diseases).

function in a state of suspension continuously for months. If sufficient to effect this it certainly must be sufficient to modify the infinitesimal elements of the germ plasm, which are the representatives of the characters of the future organism.

That this organic connection between the cortex and the ovaries should be more perfect in some persons, families, and races than in others is highly probable; and, if this is the case, the fact would explain why some persons and families appear to be endowed with unusual ability in transmitting characteristics of family and race.

It may also furnish an explanation of the way in which the tendency towards disease and other undesirable acquired characters, and also characters of an opposite nature, which may pertain to one of the parents, may become eliminated or partially overcome. From the microscopical studies of Weismann and others, it appears to be certain that some portion of the elements of the two forms of germ plasm coalesce in the formation of the future organism, and this would insure the larger measure of influence from the more vigorous element.

Possibly it may be inferred that if the effects of a diminution in the function of the cortex may in a negative way have an effect on the ovaries and their product, the same may be true in a positive way in relation to an increase in the function of it.

There certainly exist some reasons for such an inference. Use and a favorable environment tend to attract larger measures of organic and functional energy to the brain. We constantly witness improvement in the quality of mental function from use and discipline, and if the product of function is improved, the inference is legitimate that the physical basis of it has become more highly developed and more finely organized. Indeed, we can judge of the quality of the structure only by the character of its product.

It is true that such acquired characters do not always appear in offspring; and with reason. Both parents rarely possess like acquired characters, and those of one parent may often wholly neutralize those of the other. Again, every one represents characters of the nervous system which are of diverse tendencies, which reach back through many generations in two families. The influence of atavistic tendencies is always operative, and leads to variety, and not uniformity, of characters.

BRITISH MEDICAL ASSOCIATION AT MONTREAL.

SECTION OF PSYCHOLOGY.

At the recent meeting of the British Medical Association held at Montreal, the Section of Psychology, which met in Morris Hall, Presbyterian College, was opened on Wednesday, September 1st, by an address from the chairman, Dr. R. M. Bucke, of London, Ontario, on "Mental Evolution in Man." He first spoke of the fruitlessness of the introspective methods of studying psychology which have been followed down to our own time, and then passed to comparative psychology, which, he said, showed that man's mind was passed to him after infinite ages of slow evolution and amelioration through tens of thousands of generations of placental mammals, our immediate progenitors. In this question of mind he recognizes two distinct processes: first, a gradual evolution toward perfection of faculties that have already come into existence; and, secondly, the springing into existence of faculties which have previously had no existence, as hearing and sight, which are developed by slow degrees from the sense of touch. He supposes mind growing in this way for millions of years. It begins as mere excitability, to which is added, after a long time, discrimination of food. After another long interval, sensation appears, with capacity for pleasure and pain; then memory, recognition of offspring, reason, recognition of individuals and communication of ideas. Concurrent with these intellectual faculties certain moral functions, such as fear, surprise, jealousy, anger, affection, play, sympathy, emulation, pride, resentment, grief, hate, revenge, shame, remorse and a sense of the ludicrous also arise. Mind finally reaches the plane of the higher animals, which is equal to the mind of the human being at about two years of age. At the age of three, self-consciousness is born and, psychologically, the infant becomes a human being. The infant still has to acquire, among others, the color sense, the sense of fragrance, the human moral nature and the musical sense. When self-consciousness first appeared it

must have been at maturity, which we may put at the age of twenty, since childhood and life were both formerly shorter than they are to-day. As we reach mental maturity at the age of thirty-five (average), the advance of the individual from three years to thirty-five represents the advance made by the human mind since self-consciousness first appeared. Of the mental faculties below self-consciousness, each has its own time for appearing in the human infant, as memory and simple consciousness appear a few days after birth, curiosity ten days after, the use of tools twelve months after, and shame and remorse, and a sense of the ludicrous, about fifteen months after. As to animals, memory and simple consciousness occur in the echinodermata, the use of tools is not met with below monkeys, while shame, remorse and a sense of the ludicrous are almost entirely confined to the anthropoid ape and the dog.

As in pre-human so in human psychology each super-added faculty was acquired in its own time in the history of the race, and that historic period corresponds with the time in the life of the individual into whom the faculty is born to-day; thus it has been proved that the color sense was acquired by the race about thirty thousand years ago. It is acquired by the individual at five or six years of age. There are three other laws which are worthy of notice, as follows:

1. The longer a race has been in possession of a given faculty, the more universal will that faculty be in the race.
2. The longer a race has been in possession of a given faculty, the more firmly is the faculty fixed in each individual who possesses it.
3. A study of dreaming seems to reveal the fact that in sleep such mind as we have differs from our waking mind.

Dr. Bucke then compared the faculties of simple consciousness, shame, color sense, moral nature, and musical sense, in the light of these laws, and concluded with the following corollaries: First, that, according to this theory, all forms of insanity and all forms of idiocy are due to atavism. Second, that the human mind is not at present formed, but forming. In conclusion, he spoke of the third, or higher, forms of consciousness at present appearing in our race, which appear, when they do appear, in individuals between the ages of thirty and forty.

An editorial in the British Medical Journal of September 25th disagrees with some of Dr. Bucke's statements, and the writer seems to think that Dr. Bucke is assuming too much when he gives periods for the development of our faculties. The writer also calls attention to the fact that if we have gained some powers, we have lost others; "our tails have atrophied, and so, we think, has the sense of direction which enables dogs and cats to travel many hundred miles home."

Dr. George Rohé, of Sykesville, Md., followed with a paper entitled "The Etiological Relation of Pelvic Disease in Women to Insanity." Dr. Rohé first spoke of the neglect to which patients with pelvic diseases are often subjected, both in England and America. He then spoke of the legality of surgical operations upon insane persons, and showed how the question was answered by decisions of the United States courts. He summarized these decisions. First, the act of a lunatic during a sane interval has, in law, the validity of a sane person, therefore a lunatic in a sane or lucid interval is as competent to consent to a surgical operation of any kind as any person.

Second, the State, acting through courts of equity, is the guardian of all insane persons. The committee which is appointed by this court has power to grant consent for any operation which may be for the lunatic's benefit.

Third, the lunatic may, even if there is no absolutely lucid interval, be competent to give consent to the performance of an operation if he understands its objects and consequences. It is here that the surgeon is placed in a delicate position, as he must take the responsibility of determining whether the lunatic has that degree of capacity requisite to consent.

Dr. Rohé then spoke of the prevalence of pelvic lesions among insane women. In his own examinations he had found sixty per cent. who had some abnormal condition of the pelvic organs, while Dr. Isabel Davenport, of Kankakee, had found as high as eighty per cent. While alienists agree that insane patients have the same right to surgical treatment as sane, in practice this is not carried out, and affections imperiling life do not receive adequate attention. He then briefly reported thirty-four cases which he had operated upon since 1891, with the following summary: Eleven cases made complete recoveries, mental and physical;

nine cases improved, some very decidedly; eleven were unimproved in mental condition, and there were three deaths consequent upon the operation. Several of the cases noted as improved and unimproved had apparently recovered but afterwards relapsed. The total recovery rate was thirty-two per cent.

Dr. A. T. Hobbs, assistant physician in the Asylum for Insane at London, Ontario, continuing the subject, read a paper entitled "Surgical Gynæcology in Insanity." He gave very careful statistics of the London Asylum for the Insane for two and a half years. Out of a hundred insane women examined, pelvic disease existed in ninety-three, and in eighty-nine operation was necessary for the improvement of their physical condition. He then discussed the reasons for surgical treatment in this class, and gave a synopsis of the cases in which operation was performed. Hysterectomy was performed twelve times, fixation of the uterus by Alexander's operation eight times, and by ventri-suspension three times. Divulsion and curettage were performed in fourteen cases. Repair of cervix and curettage were performed on twenty-seven patients. Ten patients were operated upon for diseased tubes and ovaries. Of eighty cases, thirty-seven and a half per cent. made mental recoveries, twenty-two and a half per cent. improved considerably, and thirty-five per cent. showed no mental change. Death followed operation in four or five per cent. He concludes that surgical gynæcology among the insane has gotten beyond the experimental stage, and that it should be recognized and encouraged.

The next paper, on the "After Effects of Surgical Procedure on the Generative Organs of Females for the Relief of Insanity," was read by Dr. James Russell, of Hamilton, Ontario. After making a few remarks on the interdependence of functions of the organs of the human body, he deprecated the tendency of specialism to warp the judgment of the specialist who makes a group of morbid conditions, however slight, responsible for most of the mental and nervous ailments of mankind. He referred especially to surgical gynæcology, and asked if it is true that pelvic disease is the principal cause of insanity, why men do not enjoy a greater immunity than women?—statistics proving that the ratio of insanity between men and women is about equal.

Dr. Russell then gave histories of three cases in the Hamilton

Asylum which illustrated the after-effects of surgical interference for the relief of insanity, in all of which the symptoms were aggravated rather than relieved. He concluded his paper with the opinions of a number of alienists.

The three last-mentioned papers were discussed by Drs. Dewey, D. Clark, J. W. Burgess, E. N. Brush, Urquhart (Perth), Alexander, Spitzka, Meek, and Turner. There was so much interest in the many questions that arose that the debate was adjourned until the next day. When the section again met, on Thursday, September 2d, at 10 A. M., Drs. Rohé, Hobbs and Russell closed the discussion.

Dr. H. P. Stearns, of Hartford, Conn., read a paper entitled "Heredity a Factor in the Etiology of Insanity." He took as his basis for discussion the theory of Weismann, who says, "It is impossible to imagine any way in which the transmission of changes produced by the direct action of external forces upon the somatic cells can be brought about," and gave anatomical and physiological reasons for belief that Weismann was not correct. He spoke more particularly of the connection between the nervous system and the ovaries, and said that this connection was probably more perfect in some persons than others, as some persons and families seem to be endowed with unusual ability to transmit the characteristics of family and race. He gave as the reason that acquired characteristics do not always appear in the offspring, that the parents rarely possess the same acquired characteristics, and that those of one parent might wholly neutralize those of another. Dr. Urquhart commended the paper and agreed with Dr. Stearns. The President regretted that there was no representative biologist of the Weismann school present to discuss the paper from an opposite standpoint.

Dr. Edward N. Brush, of the Sheppard Asylum, Towson, Md., gave "An Analysis of One Hundred Cases of Acute Melancholia." His paper was largely statistical, and while, as Dr. Brush said, the cases were too few in number to establish any criterion, they agreed very closely with other observers. This group was composed of cases admitted during the first five years of the history of the Sheppard Asylum, and formed twenty-eight per cent. of all admissions. Of the one hundred cases, fifty-nine were men, forty-one women. Forty-eight men and thirty-two

women had simple acute melancholia, one man and eight women were of the confusional or stuporous type, and ten men and one woman had hypochondriacal tendencies. In cases discharged recovered the average duration of attack before admission was, for men two months, for women four months and a half. The average time of treatment of cases discharged recovered was, for men five months and eleven days, for women eight months and three days. Dr. Brush said that these figures emphasized the necessity for prompt treatment, and that many hospital physicians persistently urged that not only was the prospect of recovery jeopardized by delay, but the period necessary for treatment was prolonged. Mercier's dictum that the two great factors in the causation of insanity were "stress and heredity" was upheld. Dr. Brush spoke of this class of cases as showing to a large extent gastric and intestinal indigestion, and said they offered a very fertile field for investigation by the physiological chemist, but we must not attribute too much to auto-intoxication, etc., until we know more of the chemistry of our bodies. The treatment was principally to secure sleep and to improve the nutrition. Most of the patients gained weight while under treatment. Thirty-eight, twenty men and eighteen women, were discharged recovered; twelve men and four women much improved; eleven men and nine women improved; five men and four women unimproved, and five men and three women died. Six men and three women remain under care. Sixty-six per cent. of the cases showed suicidal tendencies, and were all of the simple acute class. The paper was discussed by Drs. Sinkler, Burgess, Dewey, Rohé, Haslett of Sunbury, England, who said he had had good results following washing the stomach with strong boracic acid, and Dr. Brush, who, in closing the discussion, said in reply to questions that he regarded hypochondriasis as an unfavorable condition, also picking at the skin. He thought travel desirable in chronic cases, but thought it aggravated the general neurasthenic condition of the acute cases. He did not believe in seasonal melancholia, and thought that in this he was in accord with Dr. Weir Mitchell.

Dr. Daniel Clark, of Toronto, Ontario, followed with a paper entitled "Reflexes in Psychiatry." He began by saying that in the last quarter of a century a large number of the medical profes-

sion has taken to so-called specialties, and that as far as diagnosis and surgical treatment were concerned, these were advantageous to the patient, but the result was rivalries and controversy in respect to the merits the different special branches bore in relation to general health. These circumscribed practitioners had much assurance in claiming the successful treatment of the diseased organ of which they know the most, as being the one thing necessary to ensure bodily and mental health. The first error which led to this lopsidedness was that they forgot that a specialty, to be successful, must be based on a thorough knowledge of the whole human organism in health and disease. The second error was that such people attach too much importance to reflex action in disease. The third error, which is allied to the second, lies in a misunderstanding of the term "reflex action." A true reflex circle must have three distinct neural structures, an afferent nerve, a focal nerve cell or cells, and an efferent nerve. In many diseases we have what the Germans call "associated sensations," or "co-sensations," where the influence generally ends in some part of the great nerve centres, with no direct outward stimulation, and so cannot be called reflex. A large number of diseases found in organs are only made manifest in these organs, and are caused by disease of the nerve centres and their ramifications. Dr. Clark then referred to surgical gynaecology, and said that too much prominence was given to diseases of the pelvic organs as a cause of insanity. His experience showed that not more than three and one-half per cent. of female patients have any serious derangement, yet at least forty per cent. are certified as having become insane through this cause. Extirpation of the ovaries was a prolific cause of insanity and not a cure. Dr. Clark concluded with quotations from the writings of Dr. Bremer, Dr. Allbutt, and Dr. Skene in support of his views.

Dr. Campbell (Carlisle, England) thanked Dr. Clark for his lucid, definite paper, and said that even asylum physicians were occasionally affected by waves of treatment.

The next paper, on "The Influence of Physical upon Mental Disease," was read by Dr. W. J. Handfield Haslett, of Halliford House, Sunbury-on-Thames. He said that his subject was an obscure and difficult one, but feeling that it possessed great

possibilities of investigation, he brought it before the Section hoping to kindle their interest in it. Nearly a half a century ago Prof. Griesinger, of Berlin, recorded the effects of epidemic diseases upon the insane. He found that after an extensive outbreak of typhus among the insane at Schleswig there was a permanent beneficial influence in a large number of cases, and equally manifest in mania and melancholia. Cholera had an unfavorable effect, and dysentery had no influence at all, not even on attacks of periodical insanity. Koster, of Siegburg, studied the effect of intermittent fever upon the insane, and out of twenty-four patients attacked, seven recovered from their insanity, seven improved very much, and ten cases of advanced dementia remained unchanged. Dr. Haslett had seen four cases of intermittent fever among the insane, and in only one did it have any effect. In this, a case of paresis, a complete remission of symptoms occurred when there was a recurrence of fever. In cases of fatal illness among the insane there is often a clearing up of the intellect before death. This has been observed in stuporous and delusional patients, and Hoffman asserts that this occurs in cases of advanced dementia, but this is inconsistent with our views on cellular pathology. Savage says that diseases which produce temporary or permanent cure are either febrile or painful, and this is probably correct, as most diseases are one or the other or both. Influenza and cancer are notable exceptions to this. With regard to the effect of influenza upon the insane, the physicians of the Royal Edinburgh Asylum reached the following conclusions: First, there was frequently an aggravation of mental symptoms. Secondly, in no recorded instance did influenza produce any mental improvement in the patient. Lastly, insanity as a sequela to influenza in the sane was of an evanescent and curable nature. Schmitz agrees with this, but Dr. Haslett found cases in which this was a most intractable cause of insanity. Dr. Haslett then discussed boils, suppurating wounds, etc., and their effect on the insane, and also the mental diseases in which mental improvement most frequently followed an intercurrent physical disease, concluding with the following summary:

That febrile, suppurating, and sudden diseases are most likely to produce benefit, particularly boils, carbuncles, erysipelas, and some of the specific fevers.

That protracted and debilitating and wasting diseases, producing anemia and loss of blood, rarely produce any mental improvement. That the purely convulsive neuroses are rarely capable of any amelioration in this way.

That stuporous mental states and the second stage of acute attacks are most readily influenced for good.

Lastly, that the evidence chiefly points to the influence being produced by unwonted afferent impulses produced by the abnormal peripheral irritation.

The President said that his experience was opposed to the theory that operations were followed by recovery simply as an effect of the operation, regardless of the condition necessitating the operation. He had once reported a case in support of this, but the case had now relapsed. Dr. Spitzka said that in Dr. Israel's clinic he saw a case in which a skin-deep incision had been made and the patient believed a serious operation had been performed. This was followed by recovery. The discussion which followed again reverted to the relation between pelvic diseases and insanity, and the value of gynecological operations for the relief of mental symptoms, which was a continuation of the discussion on the papers of Drs. Rohé, Hobbs, and Russell, which had occupied so much of the previous session. It was participated in by Drs. Clark, Dewey, Burgess, Brush, Urquhart, Alexander, and others. The view that found most favor was that surgical interference with the genital organs of insane women should be practised only when the same indications were present which demanded operative procedure in the sane. The meeting then adjourned until Friday.

The concluding day of the meeting, Friday, September 3d, was opened with a paper on "Some New Clinical Studies of Inebriety," by Dr. T. D. Crothers of Hartford. He said that from sixty to seventy per cent. of all cases are traceable to heredity, that is, the ancestors have been inebriates, insane, epileptics, or neurotics. Beyond heredity, injury and disease are traceable as causes. In a certain number of cases a long prodromic stage of moderate drinking precedes the excessive use of spirits; in others the excessive use begins at once.

The forms of inebriety are practically the same as those of insanity. The periodical, convulsive, epileptiform, and the

delusional and confusional manias and dementias are most common. Paretic delusions of vigor, strength and power to refrain from using spirits are common to nearly all cases. They also develop degrees of moral palsy or a deficient sense of right and wrong. The higher brain centres are broken up, and there is profound impairment of the brain. Sensation is impaired. Sight, hearing, taste, smell, touch and sensation of heat and cold are lowered and palsied. Memory, ideation, attention, time reaction and perception are diminished and enfeebled. The faulty delusional reasoning follows naturally from the operation of the faulty senses. The heart and other organs are similarly deranged. Shock and other psychic disturbances are often followed by inebriety. In some cases where alcohol is used continuously it seems to prevent the outbreaks of violent manias, or of epileptic attacks. The specifics which destroy the craze for drink in one day, or four weeks, are empirical. Hospital treatment extended over a long period is the only scientific method of cure. The cases which can be restored to health form twenty to thirty per cent. of all cases. Inebriety is often a symptom of some exhaustive irritation which, when discovered and removed, constitutes a cure. Finally, statistics and clinical studies of cases make it clear beyond all doubt that inebriety is insanity, obscure and masked, starting from the same range of physical causes, following the same lines of progress, and curable in substantially the same way.

Dr. D. Clark thought that the notion of a latent explosive taint which was fired by alcohol very possible. The President recalled cases where a man suddenly took to drink and as suddenly gave it up. Such cases finally become chronic drunkards.

Dr. James Russell, of Hamilton, Ontario, then read a paper entitled "The Relation of Insanity to the State," which began somewhat fancifully with a visit of a traveller from Mars to the earth. This Martian, after seeing the earth pretty thoroughly, would telegraph to the Mars Gazette that the most splendid evidence of our Christian civilization was the ample provision for the insane. Dr. Russell then gave some statistics from official returns. The Commissioners of Scotland report from 1859 to 1896 an increase of thirty-seven per cent. in population, and an increase of private lunatics of ninety-seven per cent., of criminal

ninety-six per cent., and of pauper one hundred and thirty-nine per cent.; a total increase of one hundred and thirty-two per cent. The Commissioners for Ireland only furnish returns from 1880 to 1895, which show a decrease of population of twelve per cent., while private lunatics increased twenty per cent., criminal lunatics decreased eight per cent., pauper lunatics increased forty-three per cent.—total increase forty-one per cent.

The United States Census from 1880 to 1890 shows an increase in population of twenty-four per cent., and an increase of the insane of all classes of nineteen per cent.

In Canada the census returns give one lunatic to every three hundred and sixty-one of the population. There are no comparative returns available. In the Province of Ontario the census and provincial returns show an increase of population from 1871 to 1895 of thirty-six per cent., while the increase of insane for the same period is two hundred and forty-five per cent. While the greater accuracy of registration will account for a part of this increase of the insane, there are deeper and more potent causes. The latter half of the present century has witnessed a tremendous revolution in moral, social and physical dynamics. A new king has arisen who knows not the common people, the king of mechanical force. Steam and electricity, with the multiplicity of purposes to which they are applied, have so usurped the ranks of labor that multitudes are thrown out of employment, and many of them, unable to adjust themselves to the altered conditions of the labor market, become a charge on the various charity organizations, which is the first stage of physical and mental degeneration. The rise of plutocracy, with its power of concentrating wealth, has increased the ever widening breach between capital and labor, and the couplet—

“ Ill fares the land, to hastening ills a prey,
Where wealth accumulates and men decay.”

may well be applied. The popular opinion of the day is that the vast increase of insanity is due to the restless spirit of the age, the intense competition in business, and the break-neck struggle for wealth, place and power. There is an element of truth in this, but to rank it as a great predisposing or exciting cause of insanity is merely a popular fallacy. Statistics show that the great increase in insanity comes from the pauper class, and that

it has decreased in the private class. Heredity and vice account for a large proportion of the mental alienation of the present day. The curse of drink has done much to demoralize the human race mentally, morally and physically. The scourge of syphilis has been the most deadly enemy to the upward progress of the human race the world has ever seen. Its peculiar affinity for attacking the brain and nervous system is one of the marked features of its history. The fatal form of insanity known as general paralysis of the insane is now recognized by high authority as in every case to be due to this virulent poison. Various remedies have been proposed to stem the tide of ever increasing mental degeneration. Some would prohibit marriage among degenerates and criminals; others advocate the asexualisation and emasculation of these classes, while others would confine them for life in institutions to be erected and maintained by the State. Dr. Russell was not enamored with any of these; he thought the further elevation of the human race must be along the same lines and through the operation of the same laws which had governed the universe in the past. Two great factors would bring about the desired elevation. The first was education, which would develop the mind power and fit every person for the highest duties of citizenship. The second was the division of land, so that the masses should enjoy a larger share of the wealth-producing power of the world. It is the unequal distribution of wealth and the stern struggle with poverty which is the millstone about the neck of the masses that is dragging them down to mental, moral and social degradation. It was a pleasure, however, to turn from this pessimistic view to the development of that splendid altruistic spirit of the classes, which was doing so much to ease the distresses of the masses, but we sighed for a greater equality, the equality of opportunity.

Dr. Campbell quoted the case of a woman who, in four generations, had some five hundred descendants, who had cost the State of New York some one hundred million dollars, every descendant being either criminal, prostitute, or insane. Dr. Clark spoke of the position held by syphilis in the causation of insanity. He thought its influence over-exaggerated. Dr. Urquhart spoke of the Scottish tradition that once all epileptics were castrated, with the result that there are extremely few epileptics now in Scotland.

Dr. Brush said he regretted that no one had touched upon the sociological questions involved in Dr. Russell's paper. He felt that he could not let the remarks of the essayist pass unchallenged. Whatever might be thought of the statistics which Dr. Russell presented, showing the disproportionate amount of insanity among the so-called pauper classes as compared with the insane cared for at private expense—and he believed they were susceptible of an explanation widely at variance with Dr. Russell's views—he felt that what the doctor said of inequality of opportunity, the oppression of the poor, and the millstone which was dragging down the masses to mental, moral and social degeneration, should meet with a decided protest from this audience and at least on this side of the Atlantic.

If Dr. Russell read the history of his own country aright, and compared the condition of the masses of those who gained their daily bread by the sweat of their brows at the present time, with that of the same class, let us say in the time of good Queen Bess, he must know that as far as opportunity of earning and enjoying all that made life worth living, the laboring man of to-day was in the position of the ruler of that time. He was better housed, better fed, better clothed, and could, without cost, give his children a better education than was then obtainable by the sons and daughters of the wealthy.

It is not equality of opportunity that is needed to lift up the pauper to the level of the rich man, but equality of ability. From the earliest days of the history of man there have always been those who have "seized the skirts of happy chance," and those others who, with equal opportunity, had not the equal ability or the equal courage of their convictions. Much of the alleged discontent of the masses—and the speaker did not wish to deny that, unfortunately, much existed—was fomented and sometimes created by publication of just the sentiments to which Dr. Russell had given utterance, and it was time that a protest should be entered by some one.

Dr. Van Gieson, of New York, then made an extempore address on "The Parenchymatous Degeneration of the Nervous System in Locomotor Ataxia." He showed that parenchymatous degeneration in nerve cells was the same as in other organs. This parenchymatous degeneration was caused by poisons, especially by

alcohol. It could be made out readily in microscopical sections. As there was no report made of his remarks, a fuller abstract cannot be given. Dr. Urquhart thanked Dr. Van Gieson for his admirable address. He considered the work done by Dr. Van Gieson to be most important to them. He asked Dr. Van Gieson's opinion on the work done by Dr. Hutchinson, who had found vacuolation of the cells in the brains in the sane. The speaker did not feel surprised that such degeneration should take place in chronic exhausting disease. Dr. Van Gieson regretted that there was not sufficient time for him to answer Dr. Urquhart's question. The meeting then adjourned *sine die*.

SECTION OF PHARMACOLOGY AND THERAPEUTICS.

At the recent meeting of the British Medical Association held at Montreal, a very interesting discussion was held in the Section of Pharmacology and Therapeutics on the Treatment of Insomnia. Dr. Charles K. Clarke, Superintendent of Asylum for Insane at Kingston, Ontario, opened the discussion with some considerations of the physiology of sleep. The majority of writers seem to agree that during normal sleep there is a vascular dilatation of the skin, and a consequent lessened blood supply in the cortex. Howell, of Johns Hopkins, advances a new theory, and in the Journal of Experimental Medicine, Vol. II, No. 3, says in part, that "the fall of blood pressure is due to a relaxation of tone in that portion of the vaso-motor centre controlling the skin vessels. The periodicity of sleep is, therefore, directly connected with a rhythmic loss and resumption of tone in the vaso-motor centre, etc. During the waking hours the vaso-motor centre is in uninterrupted activity, and the result must be the production of a condition of fatigue in this centre proportionate to the amount of stimulation. If the fatigue is sufficiently pronounced, the centre will relax and sleep ensue in spite of even strong sensory or mental stimuli. If the fatigue is less marked, as is normally the case at the end of a waking period, adequate relaxation takes place only after the withdrawal of sensory and mental stimuli, and our voluntary preparations for sleep consist essentially in devices to minimize these stimuli." Whatever the exact cause of sleep, it seems to be proved beyond doubt that during normal sleep there is cerebral anæmia with corresponding vascular dila-

tation of the skin, and in directing treatment in many of the forms of insomnia we should take cognizance of this fact. Germain Sée's classification of insomnia seems to be very generally adopted. This is as follows: 1, Dolorous; 2, digestive; 3, cardiac and dyspnoeal; 4, cerebro-spinal and neurotic (general paralysis, acute and chronic mania-hysteria-hypochondriasis); 5, psychic insomnia; 6, insomnia of physical fatigue; 7, genito-urinary; 8, febrile and autotoxic; 9, toxic. It is with the cerebro-spinal and neurotic cases that we are chiefly concerned, and in regard to these there is the greatest difference in treatment. Long ago Dr. Joseph Workman pointed out that there was little to hope for from the protracted administration of hypnotics, sedatives and narcotics in these cases, but that, on the contrary, we might look for unsatisfactory results. In a general way this is correct, and possibly, as pointed out by Dr. E. N. Brush, the great danger in all these cases is the routine practice of giving hypnotics in insomnia. We are all alive to the fact that, in a sense, loss of sleep is more fatal than loss of food. Manassein has well shown this. We also know that a few hours of normal sleep are of more importance to the patient with acute mania than anything else. How shall this sleep be established? We have a long list of hypnotic drugs at our command, and each year this list receives many additions, but we have not yet the hypnotic panacea. If, as is claimed by Maurice de Fleury, attacks of insomnia are generally caused by either increase or decrease of arterial pressure, the failure of one particular drug to meet all cases can easily be understood. In the sleeplessness associated with acute mania, drug treatment is at times extremely valuable in the early stages, but if marked beneficial results do not occur almost at once, they will not appear at all, and harm will result from the drug treatment. It is better by simple physical means to restore normal arterial tension and restore sleep. The warm bath at 104° F. for twenty minutes, with cold applications to the head, has been very successful. Patients will sometimes fall asleep while in the bath. The danger of collapse during the warm bath is no greater than with some of our hypnotic drugs, and is less with a temperature of 104° F. than with 110° F., which is sometimes advised. A cup of hot milk or a hot toddy at bedtime is sometimes worth a dozen

doses of chloral. When the blood pressure is low, as in the insomnia of neurasthenia, massage, friction, douches, and, at the same time, caffeine and digitalis as heart tonics, will raise arterial pressure and produce sleep. A. W. McFarlane, of Glasgow, says that habit plays an important part in the insomnia of healthy persons. They sometimes curtail their sleep unduly, to find, when the necessity is past, that they cannot sleep. Their brain cells have acquired the bad habit of activity when they ought to be reposing. For these overwrought and oftentimes nervous people, a glass of hot milk or a half-pint of bitter ale often answers every purpose. Sometimes it is necessary to arrange the patient's diet on a physiological basis, and regularity in the habit of retiring should be cultivated. Change of air is extremely valuable, and an outing under canvas in the northern woods will often work wonders. We must not forget, however, that insomnia is sometimes more than a bad habit, and may be a symptom of other trouble which we must find and the underlying cause of which must be treated. If neurasthenia is to be regarded as one of the autotoxic diseases—and there is abundant evidence to support this view—in all probability the effect will disappear with the removal of the cause. The same remarks apply to all cases of insomnia resulting from toxæmia. G. G. Van Schaick concludes that insomnia is an important complication of surgical disorders. Where pain is the chief factor, morphine is the drug most certain to relieve, but there is a strong feeling in favor of trional. Most writers believe that in the majority of cases of insomnia drug treatment is to be avoided if other more simple methods of inducing sleep are successful. They should certainly be tried before drug treatment, and in any case the condition of the arterial pressure should be studied and noted before any line of treatment is decided on.

Dr. Reynold Webb Wilcox, of New York, followed and said that insomnia was simply a symptom, and that he agreed with Patrick in the opinion that it might be the symptom of some latent brain disease which the conscientious physician would search out and treat, and not attempt to avert some indefinite and vaguely threatened disaster by attacking the insomnia alone. So, too, should there be circulatory changes, kidney disease, etc., these should be treated before the insomnia. Routine prescrib-

ing is utterly indefensible; equally so is the reckless administration of drugs. We desire sleep-persuading, not sleep-compelling, drugs.

What is the mode of action of hypnotics? That cerebral anæmia alone cannot cause sleep is evident when we consider what happens after a severe hemorrhage, producing a true cerebral anæmia, when wakefulness, not sleep, is a marked symptom. According to Howell, the three factors which combine to produce sleep are, first, a diminution of irritability, caused by fatigue, of large portions of the cortical area; second, voluntary withdrawal of sensory and mental stimuli involved in the preparations for sleep; third, the diminished blood supply to the brain. The chemical theories of sleep advanced by Sommer, Preyer, Pflüger or Cappie, who believed that there was, first, diminished molecular activity of the cerebral cells coincidently with capillary anæmia of the brain, and, consequently, second, that the brain occupied less space. These statements, in connection with the studies of Hodge twenty years later, which demonstrated that cell volume and contents diminished after fatigue, bring us nearer a working hypothesis for the action of hypnotics. The theory of the movement of the neuron as advanced by Rabl-Ruckhard in 1890, and later by Lepine, Duval, Ramon y Cajal and Decrum, is the most satisfactory.

The alkaloids hyoscyamine, hyoscyne and scopolamine seem to possess a peculiar usefulness in the treatment of the insomnia of the insane, especially of those conditions characterized by excitement. Pellotin, the alkaloid of the *Anhalonium Williamsii*, a cactus found in Mexico, is a new drug of vegetable origin and seems to have value. The sleep produced is singularly calm and natural, and there are no unpleasant after-effects. Dr. Wilcox then discussed in detail the oxygen derivatives of the hydrocarbons, the sulphur derivatives of the hydrocarbons, urethanes and their derivatives, the amido derivatives, and concluded with the following classification:

1. Potency—Paraldehyde, chloralamide, pellotin, trional.
2. Rapidity—Pellotin, paraldehyde, chloralamide, trional.
3. Duration—Trional (longest), chloralamide, pellotin, paraldehyde.
4. Habituation—Pellotin (slight), trional, chloralamide, paraldehyde (considerable).

5. Safety—Chloralamide, pellotin, paraldehyde, trional.

The next speaker was Dr. Alexander McPhedran, of the University of Toronto, who spoke on "Hypnotics: their contra-indications and ill-effects." After briefly referring to the nature of sleep, the occurrence of which he said was probably due to an accumulation of fatigue products, neurotoxin, in the central nervous system, he gave a list of causes of insomnia which were removable, and in which class, therefore, hypnotics should never be used. In another large class the cause is not easily discovered nor easily removed, or it may be apparent and yet impossible of removal. Of such are many cases of neurasthenia, hysteria and hypochondria. We must be careful in this class that a habit is not formed. In acute diseases sleep is often a necessity in order to secure such a restoration of the vital powers as to render recovery of health, or even continuance of life, possible. Here hypnotics are often necessary. So often in chronic diseases there may be a temporary need of hypnotics.

Dr. McPhedran then spoke particularly of the injurious effects of several hypnotics. Chloralose in three-grain doses has produced an alarming collapse in an hour, the recovery from which was slow. Sulfonal is occasionally fatal, and is more apt to be in persons with marked constipation. The continued use of trional tends to give rise to various disturbances of consciousness, of speech, of hearing and of vision, to loss of memory and to ataxia of movements in general. Serious effects have followed the administration of paraldehyde in large doses. It is a wise practice to give hypnotics rarely and only when other means have failed, then only in the smallest dose necessary to give sleep, being satisfied with the least amount of sleep that is safe.

Dr. R. Ferguson, of the Western University, spoke first of the lack of any theory of sleep which stood the test of therapeutics. Those theories which are based upon the blood supply to the brain are the most satisfactory. Hot foot or hip baths will sometimes produce the necessary anæmia. Massage is useful. In certain cases there is an excitability which transforms slight disturbances into great ones, and the insomnia is most intractable. In certain cases it is the cessation of noises which causes the sleeplessness. The patient lies awake listening and waiting for them. This sort of insomnia is less exhausting than the same

period of enforced wakefulness under great pressure. Reading oneself to sleep, if the book be a suitable one, is a common and commendable device. A placebo, or half-placebo, as some of the mild hypnotics may be called, ought always to have a reputation, whether deserved or not, so that no harm may be done by their administration. A graduated series of powders, with sugar of milk to maintain the bulk and quinine to maintain the taste, beginning with a half dose of sulfonal and ending with none at all, is a convenient method of ridding the patient of the drug habit without the disturbing thought involved in the information that he must get on as best he can without it. Hypnotics may be roughly divided into two classes, those which permit and those which produce sleep; those which diminish nervous excitability, which keeps the patient awake, and those which distinctly, though perhaps not profoundly, narcotize the nervous centres. Dr. Ferguson then spoke of several hypnotic drugs, and stated his preference for sulfonal and trional, and, concluding, said that at best hypnotics were but makeshifts.

Professor Charles Richet, of the University of Paris, speaking in French, said that chloralose studied physiologically had the special effect of benumbing the brain and stimulating the spinal cord. In a dose of ten, or at most fifty centigrammes, it induced sleep and made the cardiac circulation regular and strong. It was therefore clearly indicated in diseases of the heart, and also, as it did not in any way disorder the digestion, in diseases of the stomach. It raised arterial pressure so that it could not be said that insomnia was due to cerebral anæmia.

Dr. Donald MacAllister, of the University of Cambridge, said that he had to deal with many students who worked too hard, in whom, when examinations were approaching, the addition of anxiety to mental overstrain led to insomnia. The treatment was conditioned by the necessity that nothing should be done which would interfere with mental activity or memory. He had been driven by this condition to abandon all hypnotic drugs in the management of these cases. Simple means, such as Benjamin Franklin's air-bath, mere walking about the room naked for a few minutes and then slipping between the warm blankets, or lying in a hammock with nothing but an over-covering, or wearing a night-shirt wrung out of cold water closely wrapped round with

a flannel blazer or pajamas, were generally adequate. But there were certain cases which were overfatigued, and in these it was necessary to stimulate until the level of normal fatigue was attained. Dr. Richet's remarks as to the strychnine-like action of chloralose upon the spinal cord were of special interest to him, as in these cases strychnine was of great value. One-fortieth to one-twentieth of a grain of the hydrochloride at night was followed first by a sense of cheerfulness and then by normal sleep. A cup of strong coffee often served the same end.

Dr. Robert Saundby said that the most certain hypnotic drugs were chloral and sulfonal, and that their dangers were exaggerated. Chloral should be combined with tincture of digitalis in equal quantities. It was valuable in the insomnia of typhoid fever and in delirium tremens. In the insomnia of dyspepsia, which supervenes two or three hours after retiring to rest, a little bicarbonate of soda and peppermint water taken on waking will often give sleep.

Professor A. R. Cushney said that the chlorine compounds of the fatty series, chloroform, chloral and chloralamide, have been shown to produce fatty degeneration in various organs when given habitually to animals, and asked for information of any such effects following the administration of chloralamide and chloralose in man. The pharmacological effects of pellotin and chloralose resemble those of morphine closely. It would be of interest to find whether these newer hypnotics resemble morphine in its specific effects on pain.

Dr. Henry Barnes said that the first question we should decide for ourselves is this: "Is the patient really suffering from want of sleep?" In procuring sleep the first thing is to remove all sources of anxiety. He referred to a form of sleeplessness described by Murchison which is caused by hepatic derangement, which induced lithæmia and other forms of gout. In these cases attention to diet is necessary. He preferred paraldehyde, sulfonal and trional, but used all drugs as little as possible.

Dr. A. A. McCallum referred to the action of Behring's serum in the non-diphtheritic in producing sleep, and also that patients treated by anti-streptococcic serum fell into a deep sleep.

Dr. Learned, of Northampton, Mass., described a method of inducing sleep which he had tried successfully upon himself. The

arms are stretched toward the headboard, inspirations reduced to six a minute, and the head is held about an inch above the pillow until it is impossible to hold it so longer. Then the right leg is raised until it is necessary to drop it. Various other strained postures are assumed and sleep invariably follows. The principal drawback is that it requires considerable mental and physical exertion.

Dr. J. A. Campbell, of Carlisle, referred to his papers on this subject published in the *Journal of Mental Science* in 1873, and in the *Lancet* in 1879 and 1883. He gradually gave less and less hypnotics, and chloral was the one most used. In asylums, one patient often has to be given a hypnotic in order that others may sleep. Exercise in the open air was one of the best hypnotics.

Dr. W. S. Muir said that in his hands hydrate of chloral had given the best results. He did not think that it should be given in larger quantities than two doses of twenty grains each. In the treatment of delirium tremens it should be combined with digitalis. Bromide of potassium and paraldehyde are also good hypnotics. Lately he had had good results from sulphate of duboisin, which has an action similar to hydro-bromate of hyoscin, but is, in his opinion, safer. The conscientious practitioner will tax his own resources to the utmost, and will particularly examine into the stomach and kidneys before giving hypnotic drugs.

Dr. J. O. Brookhouse, of Nottingham, was gratified that in the discussion the treatment of insomnia was not disassociated from its etiology. He was glad to find that there was a tendency to treat insomnia by fresh air, moral help, regulated exercise and a suitable diet rather than by drugs. If recourse to drugs was necessary he thought that a combination of morphine, chloral and sodium bromide was best.

Dr. W. Whitla expressed his pleasure in listening to the discussion, which would not have been possible twenty-five years ago in the days of empiricism. He then spoke of the various hypnotics and warned against their habit danger, especially condemning alcohol. He described a peculiar form of insomnia which occurred in patients who went to bed, fell asleep in a few moments and woke again in a few seconds. These patients, he noticed, were broad-shouldered men, and the symptoms were caused by the pillow difficulty. He recommended the German wedge-shaped pillow as a specific in that form.

Dr. Andrew H. Smith, of New York, said that twenty grains of powdered capsicum in the form of a bolus will generally produce sleep promptly in a case of delirium tremens, with no disagreeable after-effects until the next defecation.

Dr. G. A. Atkinson, of Newcastle-on-Tyne, said that errors of refraction cause mental irritation in neurasthenic patients and so lead to insomnia. In old people, who have been taking opium, and in whom there is defective arterial supply to the brain, beef tea, tea or coffee will act well and sometimes entirely replace the drug.

Dr. J. J. Leech, president of the section, said that a marked feature of the discussion was the agreement of the speakers that in the treatment of insomnia drugs should be avoided as far as possible. While agreeing with this in part, there were certain cases in which the use of drugs could not be avoided. These were middle-aged persons with gouty or neurotic tendencies, immersed in business and overworked. He then described in detail his treatment of this class and spoke of cases who had almost continuous insomnia.

Book Reviews

Hysteria and Certain Allied Conditions, Their Nature and Treatment, with Special Reference to the Application of the Rest Cure, Massage, Electrotherapy, Hypnotism, etc. By GEORGE J. PRESTON, M. D., Professor of Diseases of the Nervous System, College of Physicians and Surgeons, Baltimore. Illustrated. Philadelphia, P. Blakiston, Son & Co., 1897. (pp. 298.)

The author gives as his reasons for writing the book under consideration the importance of the subject, and the fact that there is no recent book in English on hysteria. It is intended especially for general practitioners, and it is well adapted to their wants. The reader who has kept abreast of the periodical literature of the subject will not find much in it that is new to him, but, on the other hand, he will not miss much that is of practical importance. The book gives evidence of extensive reading, but it is by no means a mere compilation. It indicates throughout thorough practical familiarity with the subject in all its bearings.

In the chapter on the nature, etiology and pathology of the disease, he takes what seems to us the only tenable ground, that the disturbance is primarily in the higher cerebral centres. Its precise nature he does not claim to understand, but he conveys the impression that it is essentially a deficiency of action—a lack of sufficient stimulus to the subordinate elements of the nervous system. He looks with favor on the hypothesis of a power of motion in the processes of the nerve cells, thus making and breaking connections, and seems rather sanguine that, with improved technique, it may be possible to discover the precise anatomical changes in the nerve cells to which the morbid phenomena are due. In view of the fact that symptoms that have existed for years may vanish instantaneously and permanently, it seems to us rather doubtful, to say the least, whether there are any anatomical lesions that are likely to be persistent after death.

It does not seem to us that a mere inefficiency of action, whether local or general, is enough to account for all the phenomena of hysteria, however satisfactory it may be in respect to hysterical paralysis, in which connection the author principally considers it. In many cases there seems to be abundant evidence of activity of the cerebral centres, perverted in kind, it is true, but not inferior in amount, to what is manifested in health. Take, for instance, the phenomena of spurious pregnancy and other phantom tumors. There is evidently a positive influence emanating from the brain of a sort that most healthy persons are incapable of exerting. The pertinacity with which hysterical patients will maintain a

course of deception, in spite of the most painful results to themselves, points rather to a misdirection than an enfeeblement of voluntary power.

In endeavoring to understand the disturbance of volition, which is probably always present in hysteria, it should be borne in mind that an act of the will really involves several mental processes. There is the desire of some imagined change, and the thought of an action as practicable and adapted to bring it about. If the desire is strong enough, and the object is thought of as immediately attainable, the movement takes place. But it has long been recognized, by psychologists and moralists alike, that the mere thinking of an action has a tendency to excite it. In the hysteric this element seems to be exaggerated. In the case of a spurious pregnancy, for instance, the thought of an enlargement of the abdomen is enough to produce it. It should be remembered that in voluntary action we have in mind only results, while we may be entirely ignorant of the mechanism by which they are accomplished. In speaking we have in mind the sounds we wish to produce, not the movements of the muscles of the chest, larynx, palate, tongue and lips. Except that it is more unusual, it is no more unintelligible that thinking of an abdominal tumor should have a tendency to produce an actual tumefaction, than that thinking of a word should tend to produce its utterance. On the negative side, again, if a healthy person can be absolutely convinced of the impossibility of an action it is impossible for him to will the act. In the hysterical patient the mere thought of the impossibility of walking, of speaking aloud, of swallowing, seems to be enough to procure its realization. There is apparently a similar condition of affairs in regard to sensation. The limitations of the fields of hysterical anæsthesia, entirely different from the distribution of the nerves, the phenomena of transfer, etc., indicate the inordinate share that the imagination has in their production.

Doubtless, whatever interferes with the proper conduct of life must, in a sense, be reckoned as weakness, but most physicians can probably recall instances in which hysterical energy, when turned into useful channels, has accomplished exceptionally valuable work, and it seems to us that the defect lies more in the unreliability of, than in the deficiency of cerebral action in many of these cases.

There is not much in the chapters on symptomatology that calls for comment. The author considers anæsthesia the most characteristic and important symptom of hysteria, although he does not go so far as to say that it is always present. He quotes, without comment, the statements of Mitchell and De Schweinitz that achromatopsia is not found in American cases. The reviewer has seen a case in which, with extreme narrowing of the visual field, there was, if the statements of the patient could be trusted, absolute color-blindness. The author seems to have found the major convulsive attacks—so-called hystero-epilepsy—more common among negroes than whites in this country. The whole account of the symptomatology is very satisfactory, but we notice an absence of any full discussion, either under this head or that of diagnosis, of the

traumatic neuroses. We incline to think that he would consider the symptoms observed after railway accidents and similar shocks, neurasthenic rather than hysterical, but in view of the eminent authorities who have attributed them to hysteria, it would seem that the subject deserved discussion in a systematic work on that neurosis.

In treating of diagnosis, the author recognizes the fact that it may often present great difficulty, and calls particular attention to the danger of overlooking organic disease in an hysterical patient. He lays down the proposition that "the diagnosis of hysteria should never be made with certainty without the presence of some of the well-known somatic stigmata, such as anæsthesia, hyperæsthesia, paralysis, contracture, special sense disturbance, and the like." He calls attention to the value of anæsthesia of the cornea in hysterical amblyopia.

In regard to treatment he says: "The general practitioner, for whom this book is specially intended, not only wants to know to what class of cases the rest cure, massage, electricity, etc., are applicable, but also how these important therapeutic measures are to be carried out. Hence the sections on these and other modes of treatment are prepared with some attention to detail." This statement is borne out in the text. The directions for treatment are full, clear and precise. He lays much stress on prophylaxis, in the cultivation of wholesome habits of life, and, when practicable, removal from unwholesome influences. He considers suggestion the most important element in whatever scheme of treatment may be adopted, and urges that all remedies should be administered in as impressive a manner as possible. Apart from their mental effect on the patient, he has but little confidence in any specific effect of drugs in this condition. Electricity, also, he considers chiefly valuable as a suggestive measure, although often very useful in that direction. He has a much higher estimate of the value of massage, and especially of hydrotherapeutic measures, and is a strong advocate of the rest cure in all its details as prescribed by Mitchell, for appropriate cases. Hypnotism he finds, on the whole, rather disappointing, although it sometimes gives brilliant results. Although he is inclined to favor the views of the school of Charcot as to the close affinity, if not identity, of the phenomena of hypnotism and hysteria, he finds that a very large proportion of hysterical subjects are incapable of being brought under hypnotic influence sufficiently for therapeutic purposes, and that the relief of hysterical symptoms in this way is apt to be transient.

He finds little to say in favor of surgical interference in this class of cases. He is never weary of insisting that the seat of hysteria is in the brain, and cannot be removed with any peripheral organs, although he recognizes the fact that hysterical symptoms may be excited and perpetuated by irritation elsewhere. The use of the knife for the relief of hysterical contractures he considers entirely unwarrantable, as they will pass away completely with the relief of the nervous condition. He is especially severe on the removal of healthy ovaries in such cases, and believes that the favorable results of such operations, which, so far as

his observation extends, are usually transient, are due entirely to suggestion. On the other hand, he fully recognizes the propriety of paying special attention to any actual disease of the reproductive organs in hysterical subjects.

Enough has, we hope, been said to show that the book is a valuable one for any one who has—as what physician has not?—to deal with this class of cases. We bespeak for it an extensive circulation.

A Text-Book on Mental Diseases, for the Use of Students and Practitioners of Medicine. By THEODORE H. KELLOGG, A. M., M. D., late Medical Superintendent of Willard State Hospital, Former Physician-in-Chief of New York City Asylum for the Insane, Former Physician in Charge of Sanford Hall Private Asylum, Former First Assistant Physician of Hudson River State Hospital, and of New York City Asylum. New York: William Wood & Company, 1897.

Dr. Kellogg's octavo volume of nearly eight hundred pages is the most pretentious American medical work on insanity since the appearance in 1846 of Dr. Galt's encyclopædic treatise, and, indeed, the tendency of these contributions to the treatment and therapeutics of insanity induces a comparison not uninstructional after the lapse of a half century. Both authors feel the necessity of urging supporting and sedative treatment, and unite in condemning depletory methods; both bear witness to the prevalence of the former in institutions for the insane, but the writer of fifty years ago addresses his warning to the offending practitioner outside of the asylum, while he of the present makes the contrast only in the interests of history.

Dr. Kellogg's varied experience in large public and private asylums and in private practice has equipped him to approach the subject from its various sides, and his attempt has been "to introduce such clear and systematic subdivisions as would best tend to facilitate the comprehension of the whole subject and render the work available for students and practitioners of medicine. . . . The whole work is written independently of leading philosophical or medical hypotheses, and is the clinical rendition and general outcome of the writer's experience in psychiatry." His book may be truly characterized as an elaborate treatise on insanity.

The volume is divided into two parts, the first on "General Mental Pathology," and the second on "The Special Groups and the Typical Forms of Insanity."

In the first chapter on "The History of Insanity," is condensed a quantity of information representing an enormous amount of research. In a few short paragraphs the epochs of progress are considered, with the gradual evolution from barbarism of the present humane methods, originating in the establishment of wards for the insane in 1660 in the Hôtel Dieu, Paris; in 1675 in a large asylum at Moorfields, England; in 1681 in an asylum at Avignon, France, and in 1751 in the creation of the Pennsylvania Hospital, with provision for the reception and care of lunatics. The preparation for this systematic medical treatment of insanity

had been made in the seventeenth and eighteenth centuries by the writings of Willis, Vieussens, Boerhaave, Denis, Bonet, Sauvage, Cullen, Brown, Marshall, Cox, Crichton, Haslem, and Arnold; and the groundwork of its further development, as is well known, was laid by the energy of Rush, Tuke, and Pinel, and the earnest convictions of Esquirol, Guislain, and Conolly. An interesting contribution of historical value which the author appears to have overlooked, is that made by Dr. Balfour upon the practice of the Arabs of the eighth century, in which appears a remarkable passage from an Arabian writer, Shaik la Ajab, summarizing the principles upon which he worked: "Be it known that of all remedies, to strengthen the heart and brain is the safest and most sure, by which means the mind and action are guided aright. Do nothing to frighten a patient, and let him select his own employment. Make the senses a special subject of treatment, and occasionally give stimulants. Rest and fresh air are required for the miserable men afflicted with insanity. They should be shown every possible kindness; in fact, they are to be treated by those under whose care they are placed as if they were their own offspring, so as to encourage them to place confidence in their caretakers and communicate their feelings and sufferings to them. This will be at least a relief to those unfortunates, and a charity in the eyes of God."

The succeeding ten chapters are upon "The Statistics of Insanity," "The Nosology of Insanity," "The Etiology of Insanity," "The Evolution, Stadia, Clinical Progression, and Termination of Mental Disorders," "Psychical Symptomatology," "Somatic Symptomatology," "Pathology of Insanity," "The Diagnosis of Insanity," "The Prognosis of Insanity," and "The Treatment of Insanity."

Throughout these chapters the author has avoided expression of strong personal opinion. The sections on semeiology and treatment attract special attention on account of the refinements and completeness of their observation. The regular order in insanity is divided into four stadia: 1. Stadium cœnæstheticum; 2. Stadium actum; 3. Stadium debilitatis; and, 4. Stadium terminale. In the descriptions of these stadia which follow, remarkable precision is shown in the finer changes of mental and motor function. The distinction is drawn between the cœnæsthesia of the initial stadium and a genuine stadium melancholicum, and a plea entered against the too commonly accepted doctrine of an initiatory melancholic stage, even in cases of mania. "Knowing that this initial stadium is based physiologically on the cœnæsthesia, which is painful on account of the general morbid processes active in the system at this time, the psychopathic state of depression which prevails during this stadium cœnæstheticum is readily understood, and the incongruous supposition of melancholia as the prodromal stage of mania is avoided." With reference to present fashionable theories relating to the stigmata of degeneration, the author writes: "Like other scientific novelties, they have excited in some minds too great credulity, and as tests of mental disease they are not decisive of any diagnostic point further than the fact of individual

origin from a degenerative source, and they do not even warrant this conclusion unless the structural anomaly has attained such a degree as in some measure to impair the functional activity of the organ or part in question. Men of vigorous minds and great talent often have some stigmata with asymmetrical heads and faces, while imbeciles not infrequently present a singular symmetry of cranial and facial conformation, so as to furnish an actual type of physical beauty."

In the matter of the medico-legal status of aphasics, the author believes that the testamentary capacity of persons afflicted with pure motor aphasia cannot be questioned, and cases of sensory aphasia are not to be considered insane from the mere fact of word-blindness and word-deafness. "But if there be in addition incoherence of ideas and of speech, the intellect is evidently so far impaired that the diagnosis is extremely difficult, and the probability is that the sufferer is at least medically insane."

For the prophylaxis of insanity the author writes comprehensively upon the early life and education of children, marriage, and the adult relations of life, and suggests the following measures for State intervention:

"1. The State should disseminate sound medical knowledge among all classes as to the common causes of insanity and the modes of its avoidance, and this should be accomplished by free lectures and the distribution of reliable medical literature on this subject.

"2. The State should make it compulsory on all medical schools to establish a professorship of mental disorders, and to hold, not a nominal, but a full course of lectures on this subject, demonstrated fully by clinical material. The State examination for the degree of Doctor of Medicine should always embrace the subject of mental diseases, with clinical and practical, as well as theoretical, tests.

"3. The State should establish voluntary reception hospitals, in which sufferers from incipient symptoms of mental disease could receive prompt, skilful advice and relief, which would prevent attacks of insanity.

"4. The State should establish a bureau of protective aid for those discharged recovered from hospitals for the insane, as well as for those under some great temporary stress of mind or body liable to end in insanity."

Part II contains twelve chapters on "The Special Groups and the Typical Forms of Insanity." The classification adopted is largely ætiological, and brings out most forcibly the relation of physical and mental disorders, and the great dependence of methods of treatment upon the principles of general medicine. There is little for criticism in this section. The author appears to have passively accepted the common doctrine of the seriousness of the climacteric period. The tendency of recent literature, well represented by Dr. Currier's monograph on the "Menopause," is in the line of depreciating sensational theories of this great physiological crisis, and we believe that Dr. Mitchell has found, in a review of several thousand cases of insanity, not only that insanity beginning between the ages of forty-five and fifty is less frequent than at other periods of life, but that more cases occur at this time in men than in women.

The advent of a new book on insanity is an occasion for congratulation, especially when its author comes from the ranks of the Association. For the specialist, Dr. Kellogg's book will prove a work of ready reference to what is approved in hospital practice; for the general profession, as indicating without partisan bias what has been developed in the therapy and in the study of the physical basis of insanity, it will do much to remove the atmosphere of mystery and doubt with which the management of the insane has always been surrounded.

Clinical Manual of Mental Diseases. For Practitioners and Students. By A. CAMPBELL CLARK, M. D., F. F. P. S. G., Mackintosh Lecturer on Psychological Medicine, St. Mungo's College, Glasgow; Medical Superintendent of Lanark County Asylum, Hartwood. University Series. London, Bellière, Tindall & Cox, 1897. (12mo, pp. viii, 484.)

The author states, in his preface, that "The preparation of this work, which is necessarily limited in its contents—published as it is for general practitioners and students—was undertaken because of the new regulations, which make mental diseases a compulsory subject of medical study." The work, therefore, should be judged as a text-book.

Apart from accuracy, which is, of course, the prime requisite in a scientific work, the principal merits of a text-book are clearness and precision of statement. In these respects it does not seem to us that the present work excels. He starts out with the implication, which we suppose would not be universally accepted, that metaphysics is the same thing as psychology, and the statement that "To the average student the study of mind is wearisome and unprofitable" (p. 9), and the chapter on Mental Constitution does not seem to us calculated to relieve the study of this opprobrium. The chapters on diagnosis and prognosis precede the discussion of the different forms of insanity, and he does not there, nor, so far as we have noticed, elsewhere, make it clear whether he considers insanity one disease or several, or a symptom of different morbid conditions.

In his classification he is in advance of most British writers on the subject, admitting "Partial, or Chronic Delusional Insanity" as distinct from mania and melancholia, but he does not recognize confusional insanity under any of the terms which have been applied to it, nor does he give any adequate account of mental confusion as a symptom. Our old acquaintance, Insanity of Masturbation, is discussed at considerable length. In treating of insanity of adolescence, one of his sub-classifications is "The Masturbators, who are really Degenerates." Would such cases be examples of the insanity of masturbation? In speaking of climacteric insanity, he observes that "in the female, melancholia, mania, and chronic progressive insanity appear in about equal proportions." Are these all different manifestations of the same disease, and if so, are they essentially different from cases showing the same symptoms at other periods of life? In senile insanity likewise, he recognizes, following Fuerstner, (1) functional psychoses; (2) organic psychoses

(organic dementia); (3) a group midway between the two. Of course both functional and organic psychoses may be senile, in that they occur in old people, but they are not the same disease, nor do they present the same symptoms.

The foregoing are, we presume, sufficient examples of a method of treatment of the subject which seems to us calculated to leave the student with confused ideas in regard to diagnosis and prognosis.

In his account of general paralysis he expresses the opinion that the type of the disease has changed, quietly demented cases having increased of late years. We should be inclined to lay the change to greater accuracy of diagnosis. He attaches small importance to syphilis as a cause of this condition.

He omits pathological anatomy entirely, on the ground that the whole subject requires revision, as identical lesions to those supposed to be pathognomonic of various forms of insanity have been found in the brains of sane persons. Granting all that may be said on this score, we do not believe that changes, such as are found in advanced general paresis, for instance, deserve to be entirely passed over.

There are brief reports of cases illustrative of the various conditions described, for the most part well selected, and numerous photographs of insane persons, as good as such photographs generally are. We doubt if an expert could make a diagnosis from them in any very large proportion of cases.

On the whole, the book does not seem to us specially well adapted to the wants of the class of readers for whom it was designed, nor calculated to increase the knowledge of specialists.

The Psychology of the Emotions. By TH. RIBOT, Professor of the College of France, and editor of the *Revue Philosophique*. (Scribners, 1897.)

We have here one of the most important treatises, upon its subject, yet written. For alienists, because of its physiological standpoint, it should have special interest. As a compendium of its field to date it leaves little to be desired. We could expect nothing less substantial from M. Ribot, ex-Premier of France, and the leading psychologist among his countrymen.

The book is a revolt against the old notion that all feeling rises from the "stress of relations" obtaining between our primary perceptions and ideas. M. Ribot looks upon them as "the direct and immediate expression of the vegetative life"—"one emotion differs from another according to the quality and quantity of these organic states"—"complex emotions are derived from simple ones, and the latter from needs and instincts."

Since "all pleasures, pains, emotions, and passions," are derived genetically from these primitive instincts, the author attempts a chronological grouping of this development. The first group is essentially physiological; it includes the nutritive processes, breathing, secretion, excretion, and the like. The second group is "psycho-physical"; it includes "all the forms of external perception; the tendency of each sensory organ to

fulfil its function; . . . also all the forms of muscular movement, tendencies to action, to the production of noises (vocalization), gestures, and bodily attitudes." These tendencies, if satisfied, are agreeable; if obstructed, are unpleasant. "Hence result pleasure and pain, but not emotions so-called." These last make their appearance in the third group, and "embody one's needs as a spiritual being in the same way that breathing, hunger and thirst, embody his needs as a living being." Proceeding specifically with these "true emotions," and still in "chronological order," the author finds: (1) The instinct of conservation under its defensive form expressed by fear and its varieties. (2) The same instinct under its aggressive form, i. e., anger and its derivatives. (3) The sympathetic (non-sexual) tendencies. These three "form the first story of the building."

Then appear "slower," and with "more restricted circles": (4) The play instinct; the tendency to expend superfluous energy, from which he derives (a) physical exercise, (b) adventure, (c) gambling, (d) æsthetics. The next tendency (5) is that toward knowledge; curiosity and attention at first, but at a later stage producing all the intellectual sentiments. (6) The egoistic tendencies, showing consciousness of self, pride, etc. The latest in date is (7) the sexual instinct. "Such are the tendencies which, in my opinion," says the author, "are the roots of emotion, simple or compound. This assertion will be justified, or invalidated, by the following studies." Whereupon follow successive chapters under the above headings.

Already one may feel that all this is incongruous with the author's genetic biology, and in parts is a bit fantastic. If his book depended upon this "justification" it would be a flat failure. Its great value is elsewhere—in its wealth of learning and suggestion. Dipping deeper for an estimate of M. Ribot's fundamental doctrines, we find that he starts from the proposition that all emotions display a "double aspect." On the one hand are the "motor manifestations." On the other are certain psychic states. It is the former that are basal. These, besides movements and gestures proper, include such phenomena as blushing, tremors, changes in the secretions, etc. It is the essential feature of them all that they "are the result of *centrifugal* activities." It is here, we incline to think, that we come upon what is at once the *point de repère* of M. Ribot's view and of his crucial error. This last appears if we ask, centrifugal from what? From the brain activities causing these results is the only possible answer. Yet it is the marked feature of the book that it leaves these determinative activities almost absolutely out of account. Hence one gets the impression, for instance, that fear is *nothing but* an affection of the bowels plus an attitude.

This main theory is avowedly adopted from James and Lange. Now, besides the psychologic difficulties which have been drawn out, in sharp controversy, against it (and which, though sufficiently strong to persuade Prof. James to withdraw from his main position, are ignored by the present author), there are physiological reasons which are even more

pertinent against M. Ribot's peculiar thesis. That the brain is dominantly the seat of what he classes as the "upper stages" of instinctive conduct can scarcely be doubted in face of present biology. That these instinctive brain tendencies have their natural psychic concomitants, just as do other brain activities, is not less certain. The conclusion seems irresistible, therefore, that the ebullition of emotional feeling which a creature experiences on an appropriate occasion—say a chick at sight of a hawk—is much more essentially the counterpart of these instinctive activities, than "the sum of the sensations reverberating back from the centrifugal occurrences" which they incite. This, granting that these return sensations are important in amount at all—and here, again, there is grave doubt. There are good reasons why the brain should regulate the viscera to its varying needs. There are equally good reasons why the brain should be *protected from* "return" disturbances of the viscera. Apparently this is everywhere markedly the case. The entire bulk of exact clinical and experimental evidence goes to show that the viscera are incapable of any sensation but pain (Foster); and this looks as if the brain is "protected" in all cases save of urgent harm. Surely, if all but its painful activities are shut out, it becomes difficult, at least, to base the joyful emotions on our "vegetative life." From analogous reasons to the above, there is a growing doubt among physiologists as to how far even muscular reverberations enter into *consciousness*, as in vision; introspection cannot be trusted, there is little need for the return currents to run all the way to the cortex, and these are facts for suspecting that they are chiefly confined to the automatic lower centres.

Altogether, therefore, the James-Lange theory and M. Ribot's main thesis are covered with doubt. Rather than adopt them we may better look upon the brain ganglia as the storehouse of instincts proportionally to their size; and upon the essential ebullitions of emotion as the direct psychic counterpart of the instinctive impulses awakened therein; of the "pre-established neural relations" so fundamentally emphasized by the author. If the emotions are to be based on the instincts primarily at all, then base them here, on their undoubted seat and source of inception, rather than secondarily, or *tertiarily*, on the doubtful "shadows" of the "reverberations" of their "centrifugal results." To do this is far more penetratingly instructive to the biologist, to the psychologist, to the sociologist and moralist, and above all, in so far as this Journal is concerned, to the alienist.

One of the curiosities in this author's general position is his transitional attitude toward pleasure and pain. While his strongest aversion is against the tradition that emotion expresses the total "relational stress" of our ideas, yet he clings to the corresponding physiological doctrine which historically has its origin and sole excuse for existence in that tradition; namely, to the doctrine that agreeableness and disagreeableness express the plus or minus conditions of the body's stock of energy. If, however, the one doctrine is thrown over, the other is sure soon to follow; and very recent discussion (apparently since the author practically finished his writing) indicates that both are now wellnigh gone. If M. Ribot

holds to one leg of the ghost, it but shows how difficult it is to escape "the incurable prejudices" against which he himself inveighs. Perhaps a key to his peculiarity, here, lies in his admitting no fundamental distinction between bodily pain and æsthetic dislike; whereas it is the universal drift of latest psychology to separate the two widely. That is, to use "pain" as a purely *qualitative* term indicating, perhaps, an elementary sense-element, and on a footing with "red" and "sweet." And to look upon agreeableness and disagreeableness (including even that of pain) as an expression of the blind pregnancy of their sensory contents—of their *functional* insistence and associational trend—rather than of any qualitative element to be found in them.

To alienists the book must be of unusual value because of the prominence given to the pathology of the emotions. Each one is separately treated from its morbid side. Conspicuous in all this is the author's emphasis of "infantileism" as opposed to "degeneration"; also the stress he lays upon the individual's constitution and temperament as a whole, and the relation of cœnæsthetic changes thereto.

The breadth and scientific reach of the author are, perhaps, best displayed in his chapters on the social and moral feelings, and the æsthetic, intellectual and religious sentiments. We may not agree, however, that sympathy, as a basis of altruism, is "a highly generalized, original, psychophysical property of all living matter"; or that the "intellectual element," as opposed to the "emotional," is "never alone and by itself the spring of action"; moreover, the "play-instinct," as the fundamental source of art (the theory adopted by this author) has perhaps since Schiller been sadly overworked—rather, we should incline to say, that play is the expressive result of æsthetic feeling. The following quotations may best in themselves indicate how deeply cogent is the book to the most fundamental problems of current social and moral science:

"The family group and the social group have each sprung from different tendencies, from distinct needs; each has its special, independent psychological origin, and there is no possible derivation from one to the other." "The social instinct is not derived from the domestic feelings, while the latter are not derived from the social feelings." Gregarious life, as opposed to domestic, rests on "mutual attraction of similar beings"; on "stature, strength, means of defence, kind and distribution of food, and mode of propagation. Derived from necessity, their habit of life in common creates a solidarity which is not mechanical and external, but psychological." Moral sentiment, at bottom, "is a tendency to act, or not to act." "Tenderness is innate and spontaneous; justice, acquired and deliberate . . . If man is social and moral, it is less because he thinks than because he feels in a certain manner and tends in a certain direction." "The onward march is proportioned to what is *felt*, not to what is understood." "Æsthetic development" "has progressed from the social form to that of individualism, and from man to nature." The religious feeling "is a complete emotion, with its train of physiological manifestations, and those writers who have classed it among the intellectual feelings have only considered it under its higher forms, and when it is on the point of extinction." "The religious sentiment and the moral sentiment, though having numerous points of contact and moments of fusion, are yet, in their nature, essentially distinct, because answering to two totally distinct tendencies of human nature." "In the beginning religious feeling is not only quite a stranger to morality, but even in conflict with it." "For my own part, I am inclined to accept the priority of feeling [in the origin of religion], though unable to supply any arguments based on facts." "Every religion, great or insignificant, is an organism constituted by a fundamental belief attached to precepts, images, or concepts, *plus* certain secondary notions which are sometimes mutually contradictory, *plus* an emotional state."

On the whole the great value of this book, as we have indicated, lies in its store of current and available information, gathered with remarkable harmony of purpose and penetration of modern scientific needs. Though some of its main theories may be wrong; though it bear suggestion of "card-catalogue" and hasty "lecture-course" origin; though in places it is ragged, confused and perhaps even inconsistent with itself; and though it should be studied inquiringly rather than trustingly; yet it is, nevertheless, a truly great work—the result of a lifetime of laborious inquiry and research by one of the acutest minds of the age. It will remain the standard treatise on its subject for some time to come.

HERBERT NICHOLS.

The Insane Poor in Private Dwellings in Massachusetts. By Sir ARTHUR MITCHELL, K. C. B., M. D., LL. D., Ex-Commissioner in Lunacy for Scotland. Bost. Med. and Surg. Journ., vol. cxxxvii, No. 19.

This paper, by the Scottish apostle of boarding-out, appears in the nick of time. Taking as his text the remarks made upon the subject in the eighteenth annual report of the Massachusetts State Board of Lunacy and Charity, Sir Arthur Mitchell addresses himself, in a tone at once judicious and convincing, to the arguments raised by the board for and against the Scottish system as practised or susceptible of practice in Massachusetts. Boarding-out having had eleven years of half-hearted trial in Massachusetts in this matter of family care of the dependent insane, it is high time to inquire into the causes of what one cannot but regard as an apparent failure. Mr. F. B. Sanborn was the enthusiastic promoter of the movement in 1885. It was therefore well started. It does not appear, however, that his successors in office have ever taken up the work *con amore*. Indeed, there have been at times real enemies of the system in the board. Now, however, the discouraging statistics of the board to the contrary notwithstanding, boarding-out, or at least the principle underlying the system, is gaining everywhere in public opinion, and public opinion being so often the guide to public policy in lunacy matters, one may now look hopefully for a wider application of its benefits to the insane poor in all the more thickly settled portions of our country. Sir Arthur Mitchell's paper will prove of immense help to this end.

Quoting the Massachusetts statistics for the eleven years ending September 30, 1896, there is shown a slow (from 34 to 175) but steady growth of the number boarded-out during the first seven years, but during the last four years an equally steady decline (from 164 to 129) notwithstanding "the same effort to place patients out." Sir Arthur intimates a polite doubt whether in fact "the lack of material alone has prevented the advance of the system," as the report alleges. There must indeed have been other causes of failure. He thinks, and we believe justly, that there has been a misunderstanding of the real purpose of the system. The report concedes significantly that the number of persons who desire to receive boarders exceeds the supply. The defect must therefore be sought in the condi-

tions regulating such supply. In Scotland all that is required is a certificate that the patient is (1) incurable, (2) harmless, and (3) not in need of such special nursing as cannot easily be found out of institutions. Thus is the field widened. It would seem hardly credible that but 129 of such insane poor are to be found in Massachusetts. In discussing the advantages to patients of care in private dwellings, the report mentions "home comforts and pleasures, and measurable return to his former habits of life," and adds that "the flickering remnants of mental activity are stimulated by the presence of old familiar habits, and the patient is happier than in the hospital." This accords exactly with the results of Scottish experience, says Sir Arthur, who makes this irrefutable comment: "If it is true of any single patient that his happiness and enjoyment can be thus increased, the State has no right to deprive him of that blessing, even if it cost a little more instead of a good deal less." And is he not right in querying whether long connection with asylums does not tend to make us bad judges of what patients among the incurable could with advantage live under private care in non-institutional surroundings? It was Bucknill, we remember, who, like one of our own great men still living, insisted that alienists should breathe much of the pure air of rational life, for if we allow ourselves to become ignorant of the outside world we shall make no just comparison of the sane with the insane, and thereby run the risk of considering opinions and conduct morbid which after all are only strange.

A priori it would seem wise to select for guardians, as has been done in Massachusetts, families without young children, and we are not entirely persuaded to the contrary by Sir Arthur's assurance that in Scotland the presence of children is often a decided advantage. The question is one that affects rather the welfare of the children, whose rights in the premises may not be ignored. We confess that his reference to the educational value of the association, in so far as the child is developed along lines of sympathy, impresses us somewhat as a special plea. Light is made of the "difficulty of securing, in case of illness, the same care that can be obtained without the slightest delay in the hospital," by suggesting that patient and guardian are in this respect on an equal plane. And the Scotch critic does not mince matters in discussing and dismissing the risk that persons will "take patients for the sake of gain," for, in Heaven's name, for what other purpose would they take them? There is much mawkish sentimentality in this apprehension. We quite agree that "the motive of gain or advantage is quite a proper motive, and in good administration there is no difficulty in preventing abuses and excessive gains." But Massachusetts may perhaps be excused for an affectation of alarm on this score, in view of the modes of payment for the inmates of almshouses which obtain within her borders—and to which damaging reference is made in the report—things which Sir Arthur finds it difficult to believe, and which, he opines, will soon "be remembered with some shame as well as regret." "In one instance a town actually receives \$25.00 from an individual for the privilege of boarding-out one

feeble-minded woman who renders valuable service." No wonder then that self-seeking overseers of the poor hinder the growth of the system of boarding-out if this is their point of view, and prefer to care for their incurable insane in their almshouses. Mechanical restraint and a woful lack of comfort are not uncommon in some of these sorry receptacles. Sir Arthur is sound in insisting that "all the insane poor, *however provided for*, should be as much under the care of the State as those of them who are in asylums." In that dictum we have the whole scheme of prevention in a nutshell.

Many more interesting questions raised by the report are discussed by this experienced and thoughtful critic of the system. Only one more need be alluded to here. Objection is made that boarding-out leads to the removal from asylums of useful and profitable workers. It is refreshing to note the vigor with which the reviewer nails this error as one that ignores the obligation of the State to do for the insane poor what is best for them, regardless of selfish considerations. Moreover, he emphasizes the fact, which American experience surely confirms, that the removal of quiet patients who are good workers and are able to be helpful to themselves and others has not the effect here alleged. "When such patients are removed this is what happens: it is found that there are other patients who can be induced to work. The set of good workers being sufficient in number, no serious effort is made to lead non-workers to become workers. They are not wanted, and a refusal to work is too easily accepted as a thing that cannot be got over. In this way the removal of the incurable and harmless does good to those who are left and tends to increase the number of recoveries."

The Scotchman is not the only "hame body." Like him, the plain people of our own land are ever ready, even when insane, to exchange the pomp and circumstance of the big asylum for the *res angusta* of their saner and simpler days. Sir Arthur's plea for the system is an eloquent plea for the *man*, in whose yearning, be he Scot or American, for the life to which he was born and reared one may often find the echo of that plaintive song of Burns—

It's no in titles, nor in rank,
It's no in wealth, like Lon'on bank,
To purchase peace and rest;
It's no in making muckle *mair*—
It's no in books—it's no in lear
To make us truly blest.

Notes and Comment

A NEW LUNACY PROCEEDING IN PENNSYLVANIA.—A patient who will here be known as A. B. C. was transferred from the Western State Hospital at Staunton, Virginia, to the Pennsylvania Hospital for the Insane in 1887. At that time he was thirty-six years of age. He had been received into the Staunton hospital in 1870, and had a parole, or somewhat enlarged leave of absence in 1875, but was returned to the hospital in 1876.

At the time of his admission some history of his insanity was furnished by the person in charge. It was stated to have been, in its earlier stages, of a melancholic type, with suicidal tendencies; that shortly mania developed, following which he had become partially demented. Since the active symptoms of mania passed away he had periods of excitement, during which he had threatened violence and armed himself with clubs.

In 1886 he attempted to obtain his discharge by means of a writ of *habeas corpus*. The discharge was denied, and a copy of the judge's opinion accompanied the patient and was placed on file. Quoting from this opinion and assigning reasons for his conclusions, the judge recalled "Memories of repeated attempts to take his own life, as in Baltimore when he climbed out of the third story window; at home when he plunged down the chimney; at Winchester, when he tried to shoot himself and then broke the pistol because he failed in the attempt. Memories of the scene when he tried to cut out the heart of his own devoted father; of the time, too, when he attempted a felonious assault on a woman near the city; and memory of a similar crime suppressed and darkly hinted at, in the evidence, which could only have been committed by a monster," if sane.

On his admission to the hospital in Philadelphia he was noticed to be pale and anæmic. The eyes were dark and furtively wandering; movements quick; conversation indicating an unstable and changeable organization. During a great portion of his resi-

dence in the hospital he was subject to periods of irritability, at which times he lost self-control, became passionate, and at times his rage was violent. He frequently used profane and threatening language, and on several occasions committed acts of violence by striking and in other ways. The fits of anger were sometimes followed by periods of depression, and he seemed to be more than usually hypochondriacal. At times he tried to carry on correspondence with women who advertise for husbands; offered himself in marriage to designing people, and tried to supply himself with pictures of nude women and erotic literature. He showed a disposition to attach himself to various women, especially to those employed about the hospital, and made them presents. At times he spoke in very slurring terms of his father, and said he hoped "he was in hell." At other times he was somewhat rational in conversation and conduct, and had the liberty of going into the city with an attendant in charge to visit billiard rooms for his diversion.

Prior to his removal from the Western State Hospital, A. B. C. was declared to be a lunatic, and a committee of his person and property was duly appointed by the court.

In July, 1890, he eloped and went to Washington. On leaving the train he was arrested, something in his appearance suggesting to the vigilant officers of that locality a suspicion that he was an undesirable citizen, and he was returned to the hospital three days later. On being returned to the hospital he said the next time he eloped he would purchase a revolver and shoot the first man who touched him. He also said that if he had had a revolver when he was arrested he would have shot the policeman. After his return to the hospital he was repentant, and said he would try to conduct himself properly, but that he was persecuted and needlessly watched. During his absence his bureau and wardrobe were searched, and were found filled with all kinds of rubbish, such as old newspapers, crackers, pieces of clothing, and other articles of no value.

In 1891 he eloped from the hospital, and was returned during the following month. During this absence he seems to have walked through the State of Delaware until he reached Cape Charles, whence he proceeded to Norfolk, where he was arrested as a suspicious person and placed in jail. During this time he

seems to have endured much hardship from privation and exposure, and on his return seemed pleased that he might receive care. He was in an exceedingly repentant state, and begged to be allowed to remain in the hospital.

Soon after his return his committee was requested to arrange for his transfer elsewhere, as he was constantly seeking to escape; did not seem to enjoy the hospital, and it was thought some change would be beneficial. But as he did not desire to leave the hospital, and requested his guardian to intercede in his interest for his further residence, it was arranged that he should remain.

From time to time during his residence, down to the year 1895, he had been in frequent communication with lawyers residing in Philadelphia, and had been visited by a large number—probably ten or twelve, at different times—nearly all of whom had declined to interfere after having an interview with him.

In 1895 he was taken before Judge Hare of the City of Philadelphia, on a writ of *habeas corpus*, but after hearing the testimony the writ was dismissed, and the patient was remanded to the hospital, with the suggestion that he be allowed to travel when a suitable escort could be provided. A. B. C. was very indignant at this decision, and spoke in very bad and profane terms of the judge. He refused to leave the hospital on such conditions, and afterwards expressed a willingness and desire to remain, provided an extra money allowance was given him weekly. Several months later the lawyers who had undertaken his case made application for an order to determine the existence or non-existence of his insanity by an inquisition. This rule was granted, but was reversed by a superior court, and the reversal was afterwards affirmed by the Supreme Court of the State.

For a period of several years prior to 1896, A. B. C. had come to enjoy more and more liberty, which consisted of going out twice during each week to dine, and to go to a hotel to play billiards. In April, 1896, he again eluded the vigilance of his attendant, and attempted a journey to Montgomery, Alabama. Under the impression that this journey should begin in the City of New York, he took a train for that city, where he remained a very few minutes, boarding a return train after he had purchased a ticket from New York to Montgomery, Alabama. His

conduct on the train was such as to attract the attention of the conductor and brakeman. He seemed to be under the correct impression that he was returning by the same route over which he had passed but a few hours previously, and secreted himself in the water-closet of the car in which he was riding. He was several times directed to come out of the closet. Subsequently, after inquiring whether the train entered Broad Street Station in the City of Philadelphia, and being informed that it did, he made a leap from the platform of the car while moving at the rate of twenty-five miles an hour, sustaining a fracture and dislocation of the outer end of the right clavicle; a fracture of one of the bones of the right hand; a severe contusion of the right knee; a laceration of the forehead; and suffering from shock. On his return to the city of Philadelphia he was sent to a general hospital by the authorities, from which he was returned to the hospital for the insane the same evening.

During his treatment for these injuries A. B. C. was quite tractable, co-operated with the physicians in his care, and seemed grateful for everything that was done for his comfort. Since receiving the injury he has not been as quarrelsome as he was before, although he seemed at times restless and dissatisfied, but evidently controlled himself better and got on with less friction.

The Supreme Court of the State having held that no authority existed to determine the sanity of a person by a jury trial in order to supersede a committee, it became necessary, in the judgment of counsel, to cure this defect, and to facilitate the interests of their client by procuring the enactment of the following amendment to the State Lunacy Law:

"Section 63.—It shall be the duty of the court to which any inquisition shall have been returned, or of any court of Common Pleas of the County in which any alleged lunatic or habitual drunkard shall be confined or detained, or be under any restraint whatever as an alleged lunatic or habitual drunkard, on petition of such alleged lunatic or habitual drunkard as the case may be, setting forth that he is restored to a sound state of mind, or is now of a sound state of mind, or that he is reformed and become habitually sober, and that he demands a jury trial, to make such order respecting notice as to the said court may be advisable, and to award an issue, framed to determine the question of fact

involved, wherein the petitioner shall be plaintiff, and the committee of the person and estate of the petitioner, or the party or parties holding the petitioner in confinement or under restraint, or under detention, shall be defendant or defendants; and such trial shall be had according to the course of the Common Law, and the verdict, if in favor of the petitioner, shall be conclusive, and it shall be the duty of the court to enter judgment on the verdict and to make an order setting the petitioner at liberty and restoring to him his property, but if the verdict shall be against the petitioner it shall be advisory only. If, however, the petitioner shall not demand a jury trial, then it shall be the duty of the court to take proofs of the facts, and if satisfied of the truth of the allegations in such petition, to make an order, where an inquisition shall have been returned as aforesaid, that the commission issued in such case, and the inquisition taken thereon and the appointment of committee and all proceedings relating thereto be suspended or altogether superseded and determined as the court shall decide, and the court shall have power in all cases to make an order setting the petitioner at liberty and restoring to him his property, and it shall be the duty of the court in every such trial to direct who shall pay the costs thereof, or to apportion said costs between the parties to the issue as the justice of the case shall require, and to order and direct payment accordingly, provided, that nothing in this Act shall be so construed as taking away the right of appeal as at Common Law."

This amendment seems to have been enacted without any general discussion of its broad bearing, so far as is known, and without the knowledge of any of the parties interested, the Committee of Lunacy, or any hearing by the legislature.

In accordance with the provisions of this amended act, proceeding was commenced by asking the court to grant a rule to determine by jury trial the insanity or sanity of A. B. C., in which proceeding he would appear as the plaintiff, and the physician in charge of the hospital should be the defendant. After two postponements, a day was finally agreed upon for the hearing. On the day previous to the hearing A. B. C. set out with an attendant, as was his custom, to make a visit to the city. After leaving the hospital gate two men approached from different directions, one seizing A. B. C. about the arms, and saying he

was his prisoner, and the other taking the attendant in a different direction. A. B. C. was placed in a carriage and driven rapidly away. Five unknown men seem to have been engaged in the operation, which was accomplished in about thirty seconds.

It was learned subsequently that the patient had safely reached his former quarters in the Western State Hospital. This proceeding might seem to be an abduction, or kidnapping, or an attempt to take possession of the lunatic by parties acting under some kind of authority. No person connected with the hospital was engaged in this "taking off," which was in contravention to the lunacy laws of the State and the orderly and established practice and dignity of the hospital service, and was a manner of discharge hitherto unknown and unauthorized by our lunacy laws.

The patient, A. B. C., it appears, had been admitted to hospitals of two States according to their legal requirements. Twice he had been brought before separate judges in two States, and after each hearing had been remanded to the charge of a hospital. A jury of his own State had decided that he was mentally incapacitated to care for himself and his estate, and a committee had been appointed. When the committee applied to the court of his own State for leave to remove him, for good reasons, to an institution beyond its jurisdiction, permission was granted, but the committee was placed under bonds in the penal sum of ten thousand dollars to return its ward.

The plaintiff, as he was called, did not own any property in Pennsylvania which this act could reach. The legislature of Pennsylvania amended its lunacy law so as to furnish the special relief asked for by this client, and to enable a recent proceeding to be continued in the courts, which permitted an endless repetition. Under the amended act the court can assess the costs upon an estate of the lunatic, while the petitioners incur no costs, risks, or expense.

The insanity of the plaintiff at a previous period was not questioned, but the contention was that he had recovered and was now sane. Heretofore where proceedings to supersede the committee of a lunatic had been left with the judges to determine, now, for the relief of this patient (as was avowed), and other petitioners, a jury verdict must determine the mental state from time to time.

The contention of the present case was not so much for the personal liberty of this plaintiff, as the fact that he should control his estate, and before a court in a State within whose limits not a dollar of it was to be found.

The counsel for the plaintiff in a joint letter to the Mayor of the city represented the "taking off" of the plaintiff as a public outrage, and asked that a suitable reward be offered for the apprehension of the offenders against the peace, the dignity, and the liberty of the people of the commonwealth. It is not known that the police authorities took any notice of the affair beyond an endeavor to ascertain the facts.

The laws of Pennsylvania provide for an orderly manner of discharging patients, as well as for their admission. So far as we are informed, this proceeding is without precedent, and somewhat new, and we must ask ourselves whether the committee of A. B. C., in the performance of his duty as the appointed guardian of his person and estate, was warranted in putting hands upon him wherever he could find him, and restore both to the supervision of the courts of the State of which he was a native, where he had citizenship, and where his estate was to be found? To this question we believe it will not be difficult to arrive at a righteous conclusion.

BOARDING-OUT FOR THE INSANE.—The brand "made in Scotland" goes nowadays. Golf has spread like wildfire over the length and breadth of this continent and Scottish influences are in evidence everywhere. Is it not time to give a fair trial to boarding-out as practised north of the Tweed? The benefits accruing to the insane from this system are a never-failing topic of interest in Scotch blue-books, the thirty-ninth annual report of the lunacy board being no exception. Unabated confidence in the system is again shown, it appearing that the number thus provided for during the year 1896 was 2667 out of 14,500 under official cognizance at its close, that is, over 18 per cent. of the total registration. It was Sir Arthur Mitchell, we believe, who began the agitation over thirty years ago by publishing his *Insane in Private Dwellings*, and the system has spread by leaps and bounds ever since, and has apparently come to stay. The Scotchman is nothing if not shrewd and cautious. There must

be something in it for him as well as for the patient. And there is: for when last year, after a homicide—the first of the kind in thirty-eight years—was committed by a boarding-out patient and a protest went up from a few, it was followed by a loud counter-wail from the parish which had derived benefit from the system. Let it be once tried in America and there is every reason to believe that boarding-out would be received with hearty acclaim as a ready solution of the problem of extra accommodation for the insane. The system is consonant with modern conceptions. Experience has shown that a wider liberty often brings better results than immurement and costs less. Massachusetts adopted a boarding-out scheme under the administration of Mr. F. B. Sanborn which bade fair to succeed. For some reason or other it was not fostered, and Mr. Sanborn's successors have not seen fit to take an active, pushing interest in the work.

One sometimes hears the argument—a fallacious one surely—that there are inherent differences between the Scotch and American farming class that foredoom the experiment to failure. The universal Yankee is not the canny Scot. It reminds one of the old argument that the American is so constituted that he will not tolerate a humiliating manual restraint from his peers, although he may patiently submit to mechanical means of control. It is said we have no needy yeomanry—or if we have it is too proud—willing to eke out its scant livelihood for small hire; no small farmers who combine small means and respectability in such proportions as to make them desirable custodians of the boarded-out insane. These are surely doctrinaire objections. Let the traveler who knows his Scotland declare whether the average Scotch farmer suffers *quoad* respectability and self-respect by comparison with the cis-Atlantic husbandman. Certain it is the average American farmer, unless appearances deceive, needs every encouragement that money and additional labor, where labor is so dear, will bring. No one who has had experience in colonizing the working insane in family groups of fifteen to twenty, away from the mass and removed from close and constant supervision, but will testify to the greater comfort of the colonists. Take the testimony of the patients themselves. It is the simple pastoral life to which they have been reared. These able-bodied men work in the fields and barns and are happy, so far as posi-

tive happiness is susceptible of attainment by the insane. They return to the farm meal, after a season of honest sweating, with appetites well whetted, to be appeased with hot and savory food, which some of them have helped to cook, and which all may see and smell on the range. There is a lack of restraint everywhere; a freedom from those institutional influences that are foreign to the home. The day's work ended, the evening pipe smoked, the newspaper read, the letter written, sleep with these patients must not be wooed to be won, and they are up with the sparrows, refreshed and alert, to begin the simple, healthful tasks of the working day. It is a reflection upon the intelligence, as well as upon the humanity of our people, to assert that good hosts cannot be found for such farmer patients in America if the search be in competent hands. New York, with its extensive system of State care, with State hospitals dotted here and there among farming communities, would lend itself nicely to a thorough trial of this system. A scheme of visitation might easily be established with the willing co-operation of the medical officers. The only objection which can be urged against such a system, always assuming that the selection of patients, as well as of their homes, shall be made a medical matter, is that the hospital may be deprived of some of its best workers. Grant this, but ought not the question to be, not what is best for the hospital, but what is best for the patient? Of course, if unfair advantage should be taken of the system to relieve the hospital of undesirable patients, without special reference to their fitness for the free farm life, it would fall into speedy disrepute and ultimate desuetude. We submit that the system has never been fairly on trial in America, and that to the State that takes the pains to test its value, it holds out promise of great usefulness as a means of providing for a large proportion of able-bodied working patients for whom expensive hospital construction would otherwise be necessary.

THE INSANE IN PRIVATE DWELLINGS.—Apropos to the above, a recent work of Dr. Sutherland, Deputy Commissioner in Lunacy for Scotland, deserves consideration. From this most interesting little monograph it appears that 2700 insane persons, or 23 per cent. of the pauper insane of Scotland, are thus provided for in private dwellings, and that the number is increasing each

year. It is worthy of note that the percentage of the insane thus boarded out varies in the different counties all the way from 51 per cent., the maximum, in Linlithgow, to 7 per cent., the minimum, in Kincardine. In Scotland two classes of patients are provided for in private dwellings—those who have been inmates of asylums and go out to homes with the approval of the superintendent under whose charge they have been, and insane persons of a harmless type who have never required any asylum care. In the first instance the private dwelling is very much of the nature of a convalescent home, and is in reality a form of "after-care" which in many instances is most desirable. It is interesting to note that in not a few cases the families which care for insane persons are their relatives, and the payment for their care is a species of out-door relief. Of the 2700 insane, 800 or 900 are in small village colonies of from 10 to 40 persons. In no case is the proportion of the insane to the sane in a village beyond 5 per cent.

Imbeciles and harmless demented are the types of insanity generally provided for, but, as Dr. Sutherland shrewdly remarks, in placing the patient in the private dwelling the form of insanity is not as much considered as the individual. Those who go into private families must be free from unpleasant peculiarities and faults of temper. There are fifty per cent. more women than men, or about 1600 women to 1100 men. The majority of the patients are placed singly in families very much as at Gheel. There were, for example, only 64 houses licensed to receive four persons; 88 licensed for three; 299 for two; and the remainder, 1582, received but a single patient. The guardians in whose care the insane are placed were in 40 per cent. related, and in 60 per cent. unrelated, to their patients. It is gratifying to note that there was developed a tendency on the part of guardians to individualize the patient, to maintain and develop his personality, and finally, to enlarge his mental horizon. In many cases considerable attachment sprang up between patients and their unrelated guardians, and the relation of householder to patient, if not wholly altruistic, was not a selfish one. The cost of the maintenance of such patients in unrelated families was from six to seven shillings per week; in related families from one shilling and sixpence to five shillings, in addition to the cost of clothing.

Money was formerly paid to the guardians to purchase clothing, but this was not found to be the best way, as there was a tendency to economize at the expense of the patient. The clothing, accommodation, food and convenience are not equal to what is furnished in a modern asylum, but with all its deficiencies, the insane seem to prefer the homely life in the private dwelling to the more hygienic, elegant and orderly asylum.

An annual inspection of these patients is made by a deputy inspector representing a central authority. He may come oftener if he is needed. He reports on the suitability of the patient for private care, on the mental and physical condition of the patient, his conduct, the character of his accommodations, food and clothing. He also has the power to make any changes necessary, either by removal to another family or by return to an asylum. In addition to this central inspection, four annual visits are made by a local medical officer and two by an inspector of the poor.

It is estimated that to provide asylum accommodation for the 2700 patients who are thus cared for would require an immediate outlay of about £1,000,000 or \$5,000,000. If the interest upon this outlay be added to the increased cost of maintaining patients in asylums as compared with private dwellings, the actual saving to the rate-payers of Scotland by this system may be readily seen. Dr. Sutherland calculates that over 2,000,000 pounds sterling have been saved in buildings during the forty years covered by this system and 1,000,000 pounds in maintenance—an aggregate of \$15,000,000! While in Scotland 23 per cent. of the insane are boarded out, in England there are but 6 per cent., in Wales 19 per cent., and in Ireland none.

DOTARDS IN HOSPITALS FOR THE INSANE.—Physiological senility, if there be such a thing, and the insanity of old age merge and overlap in such a way in actual practice as often to make the differential diagnosis a matter of the nicest distinction. The brain condition is essentially one and the same in either case, the amount of departure from the normal being determined by, and proportionate to, the degree of degeneration. We all recognize the skilful picture of Otway, as true to life to-day as when drawn over two hundred years ago:

" . . . a wrinkled hag, with age grown double,
Picking dry sticks, and mumbling to herself.
Her eyes with scalding rheum were gall'd and red;
Cold palsy shook her head; her hands seem'd wither'd;
And on her crooked shoulders had she wrapt
The tatter'd remnant of an old striped hanging,
Which served to keep her carcase from the cold."

A greater object of compassion, or a worthier one of charity in the case of the indigent poor it were difficult to find anywhere. Of such frail and disintegrating stuff were witches made in the olden days of superstition. In the more enlightened and humanitarian present, reaction expresses itself in the asylum afforded these forlorn creatures in hospitals for the insane. But it may well be asked if the time has not come when greater restrictions should be placed upon the admission of such cases to our hospitals. Before the insane came to be regarded as the wards of the State, such cases, where there was no special demand for custodial appurtenances in caring for them, drifted naturally into almshouses, and if their friends were not always content, there was little open dissatisfaction with that disposition. To-day, in States that throw wide open their doors to all sorts and conditions of mad folk, one notices a tendency to abuse bounteous hospitality by making the State do work that the county or town did well enough in providing shelter for these victims of decay. In New York, for instance, this shifting of burden has given rise to differences of opinion between the committing physicians and the medical superintendent. Naturally enough the county or town to which the patient is chargeable is not averse from such commitment, and the friends likewise prefer to accept alms of the State. Fortunately the Insanity Law of 1896 clothes the superintendent with authority to determine whether or not a patient is insane "within the meaning of the statute"—a singularly felicitous phrase, by the way, from the point of view of an objector—and to accept or reject, according to his own interpretation of the law. In a test case, in the matter of the application for the commitment of Kate McEligott, an alleged insane person, which was an application to punish Dr. E. C. Dent, the medical superintendent, and Dr. A. E. Macdonald, the general superintendent, of the Manhattan State Hospital for contempt of court for wilfully disobeying the order

made by Mr. Justice Pryor, on the 19th day of February, 1897, in and by which it was adjudged "that Kate McEligott is insane, and that she be committed to the Manhattan State Hospital, an institution for the custody and treatment of the insane," Justice Lawrence, at a special session of the Supreme Court, held in April, 1897, decided as follows:

"The case rests, in my opinion, entirely upon the construction to be given to section 62 of the Act of 1896, and as that section, as already stated, vests in the superintendent the power, if in his judgment the person committed is not insane, to refuse to receive him in the hospital, it necessarily results that this motion must be denied." In the absence of special institutions for the care of this helpless class of dependents, it seems but reasonable that localities should be expected to carry cheerfully their own legitimate burdens when those of the State, as regards the dependent insane properly so-called, are assumed and borne with un murmuring readiness. Meanwhile the way is open everywhere for individual philanthropy to devise ways and means of comfort and cheer for the hapless dotard in his shambling infirmity till he totters mercifully to his final fall.

STAFF MEETINGS IN HOSPITALS FOR THE INSANE.—At the last meeting of the Association of Assistant Physicians a thoroughly practical paper with the above title was presented by Dr. Irwin H. Neff, of the Eastern Michigan Asylum, at Pontiac, full of helpful suggestions for those medical officers who are interested in the development of better clinical methods in institutions for the insane. The paper is most timely and deserves careful attention. Dr. Neff says:

"Staff meetings in asylums for the insane are not particularly new. In order to get a consensus of opinion, and to bring the subject more prominently forward, a brief review of it is given, together with reports of some of the methods now in use in the different institutions. In the *AMERICAN JOURNAL OF INSANITY*, issue of January, 1892, two articles pertaining to meetings of asylum physicians are given. Both of these are admirable in their scope, but it seems to me that they do not include the essentials of a staff meeting. These deficiencies exist only when applied to systematic use in asylums.

'The Seminary Method in Asylum and Hospital Work,' by Edward Cowles, and 'Journal Clubs,' by Henry M. Hurd, are expositions of clubs among asylum physicians and advocate the meetings, enumerating their many advantages. The Seminary Method is comparatively new in this country. For a description of it and for an account of its practical workings, reference is made to the article by Dr. Cowles, mentioned above. The advantages mentioned by the author are: 1st, The aim of the society to be original, thus necessitating research into literature; 2d, its co-operative effects, thus insuring mutual benefit. Two distinct lines of work are laid down. 1st, the preparation of a large subject which shall teach the student to speedily get and group many materials in a limited time; 2d, the preparation of carefully wrought theses on smaller topics, where the object shall be the most perfect work, based on a knowledge of the whole literature. The subjects more especially relating to neurological and mental science are first considered, then special subjects are chosen. As bearing upon any topic minor points can be assigned, thus permitting a contribution from more than one member of the staff. An essential part of such a 'Seminary Method' is a compulsory record of each meeting and a system of meetings.

The object of the 'Journal Club' is the abstraction and presentation of the contents of journals, which may be assigned in two ways. 1st, the assignment of a journal or journals to each member; 2d, the allotment of different subjects to the members of the club. The former method is more general, the latter method requires more individual research. A third method mentioned is to assign articles to different members of the club, and permitting a free discussion of the same. These systems, with modifications, are the basis of journal clubs.

Both of these methods have advocates. Unquestionably the formation of clubs of this sort is beneficial. In schools, universities, and general hospitals, they have been of incalculable benefit. Their success in asylum staffs would seem assured. The varied duties of an asylum physician might seem to negative such an organization. This is particularly so in many State asylums.

It has, however, been demonstrated that staff meetings are

not only practicable, but in institutions where they have been established, have become permanent. No other recommendation is needed, as it is well known that many remedies and reforms are experimented with in asylums for the insane, many of which have fallen by the wayside. It may confidently be said that in asylums where staff meetings have been instituted there is a universal expression of approval. The advantages of such meetings are apparent, and the enumeration of these seems to be unnecessary. Suffice to say, that in order to make them successful a system is necessary. For securing this, rules and regulations are demanded; in other respects parliamentary tactics and formality may be dispensed with.

In conducting the staff meetings, which I shall presently describe, three essential principles (such they have proved to be) have been considered, and experience has verified their utility. I quote them from one of the above-mentioned papers: "first, the work must be obligatory; second, a definite plan should be selected; third, the work should be thoroughly supervised." Too much stress cannot be laid upon these suggestions, as upon their adoption depends the success of the meetings.

I have personal knowledge of only a few asylums holding staff meetings and conforming to this plan. The feasibility of the meetings, however, has attracted asylum physicians. Discouragements and failures can always be attributed to a lack of system and co-operation.

It is the custom in some asylums to have daily meetings of the staff, principally for the study and planning of administrative work. It is evident that such meetings of a business character conflict with staff meetings such as I have above described.

The point I wish to emphasize is the possibility of conducting such meetings in asylums. The advantages which result can only be appreciated after a trial. The apparent impossibilities can be easily overcome without detracting from the duties of any member of the staff. To be sure, an extra amount of labor is required, but this can be so equalized that the increased duties will not prove detrimental. I can conscientiously compare staff meetings in asylums to training schools in institutions for the insane. Both are necessities, and both are advantageous.

During June, 1895, a staff meeting was organized at the

Eastern Michigan Asylum. The meetings at first consisted solely of the presentation and analysis of cases. Later journal abstracts were given, with an occasional original paper, or a consideration of a special form of mental or nervous disease. At present the meetings are conducted along these lines, having a three-fold purpose, namely, a presentation of cases, the abstracting of journals, and the reading of papers, and discussion upon some special topic. Meetings are held daily, with few exceptions, during the fall and winter seasons; during the summer season every other day is omitted. The time for convening is 11:30 to 12:15 A. M., this being the more convenient time and freer from interruptions. The time in asylums may necessarily differ, but by holding the meetings daily during business hours they are established as a part of the routine work. The secretary records the minutes of the meetings. When cases are presented an abstract and analysis are given, together with the causation, duration, and provisional diagnosis. Two days during the week are assigned to journals. Exclusive of this, other days are sometimes given to journal abstracts, at times when clinical material is wanting. The matter of presentation of cases is subject to little variation. The physician having charge of the patient gives all facts pertaining to the case; his examination, both physical and psychical, and all notes in relation to the same. The patient is then examined by the different members of the staff, and an opinion declared. This examination is then abstracted by the secretary and recorded. At the conclusion of each report is placed the causation, duration and diagnosis of the mental trouble. The resulting benefits can be inferred. It enables each member of the staff to see and examine each new case, thus securing a more accurate diagnosis, and by securing a written account it simplifies the keeping of case records.

The days assigned to journal abstracts are devoted exclusively to this. Each member of the staff is assigned generally two journals, and two members abstract at each meeting, the time allotted to each report being limited. If a quarterly or a monthly publication is abstracted, an entire meeting is devoted to the abstract, or it may be continued to some succeeding journal day.

The 'overflow days,' days when no clinical material is available, or when journals have not been assigned, are devoted to

some special topic in connection with medicine, or the reading of some original paper. Occasional autopsies have been opportune. No difficulty is experienced in getting material for the meetings. If recent cases are not available, chronic cases, or cases with questionable diagnosis or interesting symptoms can be considered.

The advantages and fitness of meetings of this nature in asylums are readily seen. They offer sufficient variability to sustain interest, and give to each member of the staff individual work, mainly on clinical lines.

Time does not permit me to deal with the minor points of these meetings. These can be satisfactorily arranged with but little trouble. They may necessarily differ in secondary features, but the details can be easily arranged. Although the 'mental analysis' is recorded in the case history under the appropriate faculties, the examination in the meeting is simplified by the adoption of a scheme. The method described by Dana in the *Post-Graduate*, July, 1896, has proved of service, and although it may appear somewhat crude, and likewise deficient, it is quite practicable, and will be found to be of considerable assistance. For convenience I give the synopsis as it is published:

I. *Expression*.—Attitude, dress, speech, writing, stigmata of degeneration.

II. *Sensation and Perception*.—Ask if the patient has pains, headaches, a good appetite, if disturbed in sleep, if he hears voices of people annoying him, if he sees any one in his room, or is troubled by people calling on him, persecuting him. Test his sight and hearing and skin sensations, his sense of taste and smell.

III. *Knowledge and Ideation*.—Ask what his business is, if he has had trouble about conducting it; ask about his family relations, his home, relatives, his political, business or professional knowledge. Find out if he has any special habits, such as drinking and smoking, his religious ideas; touch on hypnotism, electricity, any current fad of the day—the bicycles or the X-rays.

Hunt for delusions, having first found from friends if he has any, and their nature.

IV. *Emotion and Instinctive Feelings*.—Inquire as to his general feelings, whether of content or unhappiness. Inquire about his ideas on suicide, about his sexual habits, about fixed and morbid ideas, about his family, and his relations or children, in order to see if he has still paternal or filial or conjugal feelings.

V. *Volition and Attention*.—This will be tested in learning his history

and observing his attitude, and making him try to understand a problem one gives or a story that is told him.

VI. *Memory and Association of Ideas*.—This is already in part determined. Ask him about the facts about his life, his name, age, the day of the month, and about his early life, school days, etc., and then about what he did the day before. Test his power of association by making him give an account of some familiar event or object, or by making him do a sum in arithmetic.

VII. *The Consciousness*.—This must be determined by his past history, and observations of his state while under examination. Inquire particularly for morbid somnolence, insomnia, epileptic and automatic states.

From the secretary's report, which has been kept for the past year and a half, I obtain the following data: Number of cases presented, 206; number of journals abstracted, 155; number of autopsies held, 12; number of original papers, 13."

DEATH OF DR. LUY'S OF FRANCE.—Dr. Luys died suddenly upon the 21st of August of the present year at Divonne-les-Bains, where he was spending the summer.

Jules Bernard Luys was born in 1828 in Paris, where he received his classical and medical education. He became a hospital interne in 1853 and received his Doctor's degree in 1857. In 1862 he secured a hospital appointment when hardly 34 years of age. At this comparatively early period he had made valuable contributions to the pathological anatomy of locomotor ataxia and of progressive muscular atrophy. In 1864, at the death of Marcé, he succeeded to the Esquirol asylum, an institution for insane of the private class at Ivry-sur-Seine, and from this date he became intensely interested in the study of mental disorders. As the first result of this interest he published in 1865 a work entitled *Recherches sur le système nerveux cérébro-spinal, sa structure, ses fonctions et ses maladies*, which was destined to give a fresh and lasting impetus to the study of the nervous system in France.

In 1881 he published his *Traité clinique et pratique des maladies mentales*. In the same year he founded, in connection with Professor Ball, *L'Encéphale*, which was published for eight years and contained many interesting papers from his pen.

During the last years of his life his energies were largely devoted to the study of hypnotism, and he lost prestige with

scientific men in consequence of the deceptions which were practiced upon him by designing persons. There is no reason, however, to think that he was a party to these attempts to deceive the public, and he must rather be regarded an innocent victim of his own enthusiasm. He was an industrious worker and a keen observer.

DEATH OF DR. JAMES C. HOWDEN, OF SCOTLAND.—*The Edinburgh Medical Journal* announces the death, on August 17th last, of Dr. Howden, Medical Superintendent of the Royal Asylum, Sunnyside, Montrose, Scotland. Dr. Howden was born at Musselburgh in 1830, and after receiving his elementary education, spent five years at the University of Edinburgh, where he received his degree in medicine. He spent a year in medical study in Paris, and in 1853 was appointed an assistant in the Royal Edinburgh Asylum, under Dr. Skae. He was chosen superintendent of the Montrose Royal Asylum in 1857, and filled this post until failing health compelled his withdrawal a few months before his death.

The reports of the Montrose Asylum and his other contributions to the literature of his specialty indicate an active and sympathetic administration. His papers, which were frequently published in the *Journal of Mental Science*, revealed a tendency to clinical, therapeutical, and pathological investigation, and his interest in *post-mortem* revelations resulted in the publication of an ingenious scheme for the complete and convenient recording of autopsies, called an "Index Pathologicus." Dr. Howden is included by the *Journal of Mental Science* "among the first to investigate the lesions in the morbid brain," and the same journal, in 1889, said of him that his "experience has been so great, and his sagacity is so generally acknowledged, that his views on all matters relating to the treatment of mental disease must command respect."

BRANCHES OF THE MEDICO-PSYCHOLOGICAL ASSOCIATION.—The American Medico-Psychological Association appears not only to have fallen heir to the vigor of the old association of superintendents, but, with its new name, to have taken new force and increased ambition. As the oldest national medical associa-

tion it has, with singular and becoming modesty, maintained an existence wholly independent of any other organization, and has possibly hidden its light to an extent which is to be deprecated. With its reorganization and new name, the time appears to have arrived when it may properly increase its sphere of work and the bounds of its influence.

If the English Medico-Psychological Association, with the limited area from which its members are drawn, finds divisional meetings in addition to the regular annual meetings of the Association of value, why should not the American association, drawing as it does its members from a much wider area, find such meetings worthy of trial? The nucleus of divisional associations already exists if the members of organizations who are, or should be, connected with the Medico-Psychological Association will consent to become component parts of the parent organization. We refer particularly to the Southern Association of Superintendents and to the Association of Assistant Physicians. Neither of these associations appears very vigorous as an independent organization, but each might be the rallying-point for an active and useful division of the larger association.

We are not so much a national association as an American one, embracing in our organization not only the members from the United States, but the British American provinces likewise, and we might, we presume, include our neighbors on the south, especially in Mexico, where there is a growing interest in the care of the insane. Out of such an association, large in numbers and in the area which it covers, can there not be established divisional sections, meeting quarterly or semi-annually, in a measure independent and in a measure responsible to the parent organization, independent in officers, in programme, in time and place of meeting, but limited in active membership to members of the general association and branches of that body?

A northern division could be formed embracing Canada, an eastern, middle, western, northwestern, southwestern and southern, and at the various meetings of these divisions ample opportunity could be given for the attendance and active participation of those who cannot always attend the annual meetings.

Then, too, these meetings should embrace all branches of the medical service of institutions. As the organization of superin-

tendents alone lacked much which the broader lines of the Medico-Psychological Association, with its active and associate memberships open to assistants, has given us, an organization of assistants working alone equally lacks something which can only be supplied in these divisional meetings.

We trust these suggestions will be considered by our readers and that we may be favored with brief notes for publication upon the points which have been indicated and upon the feasibility of organizing divisional meetings.

GYNÆCOLOGY AND INSANITY.—The report, which we present in this number, of the proceedings of the Psychological Section of the British Medical Association, at its sixty-fifth annual meeting held in Montreal, is unfortunately defective because of the impossibility of obtaining a complete report of the discussions of the papers. As will be observed, much interest centered around the question of the relation of diseases of the pelvic organs to insanity and the necessity or wisdom of operative interference in diseases of the pelvic viscera in insane women.

The papers of Drs. Rohé and Hobbs in favor of the theory of the etiological relation of the pelvic diseases to insanity, and of Dr. Russell, which took the opposite view, occupied in their reading and discussion all of the first day's session after the delivery of the chairman's address, and the discussion was continued the following day, and was again opened by a paper read by Dr. Daniel Clark, of Toronto, on the Reflexes in Psychiatry.

The discussion of this vexed question was unfortunately not carried on in a very logical or convincing manner by either side. Dr. Rohé's paper presented the results of personal observations, as did also that of Dr. Hobbs, and each of these gentlemen either directly, or by inference, drew the conclusion that because several of the patients upon whom operations had been made had improved or recovered, the conditions for which the operative interference was made were the causes in these several cases, or in a large proportion of them, of the insanity. It is not always safe by any means to cry *post hoc ergo propter hoc*, and in no line of human experience is this more unsafe than in medicine, but we cannot concede that the papers of either Dr. Russell or Dr. Clark,

though they contained much which the over-enthusiastic asylum gynæcologist may well carefully consider, presented any proofs which, to the calm medical logician, were any more convincing than those presented by the first papers.

The weight of opinion was manifestly against the stand taken by Dr. Rohé and to some extent supported by Dr. Hobbs, but it appeared to be admitted by all who took part in the discussion that pelvic disease, which in a sane woman would require operative interference, should receive, *pari passu*, the same treatment in an insane woman.

Some of those who opposed the views of Drs. Rohé and Hobbs asserted that special nursing and individualizing the case, as necessitated by an operation, explained the good results which were reported. These gentlemen have, unconsciously perhaps, put a weapon in the hands of the advocates of active gynæcological treatment of the insane. They can now, it seems to us, very well demand of them the presentation of a series of cases recovered or materially improved under special nursing and individualized attention.

We have spoken of the assertions and claims of the gynæcologists. Drs. Rohé and Hobbs were listened to with a respectful attention which is not always, perhaps, accorded to some who have written or spoken upon their side of the question. This was because their auditors recognized that they were reporting the results of carefully collated experience, and were able to speak from the standpoint of men who had an extended and intimate association with insanity. This unfortunately has not always been true of some who have written on the subject, as it is likewise unfortunately true that many who take an opposite stand are unable, from any practical knowledge of the subject, to discuss the factors of pelvic disease. This has often been asserted by gynæcologists, but they appear to have either forgotten their own ignorance of insanity, or have assumed with a calm indifference, which we have seen occasionally in other members of the profession, that any one is able to judge of the problems of psychiatry. The whole question is yet to be solved. We predict that the less radical tone which is already beginning to be manifest in the claims and operative measures of our best gynæcologists on the one hand, and the broader and more earnest medical

spirit which has been steadily for years growing in our asylum work, will in time bring us to a common plane of understanding and agreement. Before that time comes, however, each side in the controversy will have learned much of the intricate problems of physiology, and we shall hear less of reflex irritations and of the hysterical manifestations and mimicry of disease. We shall then, through the labors of the clinician, the physiologist and the physiological chemist, have a working knowledge of the relation and interdependence of the various organs and tissues of the body, and more clearly than now recognize that no organ can say to any other, "I have no need of thee." Nor, when that day dawns, will any special practitioner be willing to say to any other, "I have no need of thee."

Medico-Legal Notes

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EXPERT TESTIMONY.—According to a press despatch, the Supreme Court of the State of Illinois has rendered a decision which will be of interest not only to physicians but to all professional men.

SPRINGFIELD, ILL., Nov. 2.—A decision has just been rendered by the Supreme Court in the case of the People against Dixon, an agreed case carried up from the Circuit Court of Sangamon County. Dr. J. N. Dixon of this city, who was called as an expert witness in a personal injury case against the city of Springfield, refused to testify unless he was paid a reasonable fee for his service, claiming that his professional opinion was his own property and could not be taken away from him except by due process of law, as provided in the State constitution. Judge Creighton ruled against him and fined him for contempt of court. The court held that this professional knowledge was not property within the meaning of the constitution, and that in the exercise of the right of the court to summon witnesses and compel them to testify no distinction could be made between kinds of knowledge. To make such a distinction would defeat the ends of justice. The finding of Judge Creighton is upheld by the Supreme Court.

Many medical men have had the unpleasant experience of being compelled to attend trials in obedience to subpoenas issued by the court, and then being called to testify without remuneration sufficient even to pay their traveling expenses. We have in mind several such instances in the State of New York, in which the physician had absolutely no knowledge whatever of the facts relating to the commission of the crime, and was summoned by the court to simply testify for the defendant, who several years before had been under his treatment. Having sworn to the fact of the previous insanity of the defendant, a professional opinion was then asked in each instance by the prosecution, not only as to the defendant's past mental disease, but also as to his condition

at the time of the criminal act and at the time of his trial. The court refused in each case to allow a fee even sufficient to refund actual disbursements.

This brings up the whole subject of expert testimony and the general dissatisfaction with which it is regarded. Any professional man whose opinion is of sufficient worth to be sought, ought to receive a reasonable compensation for his services. His special knowledge has been gained by the expenditure of much time and money, and should possess some value. He ought not to be compelled to relinquish his work, to forfeit several days' income, to incur the expense of travel and of maintenance at a hotel during the trial, without adequate pay, nor should he on the other hand appear as a partisan advocate retained by a large fee to act the part of an assistant to the public prosecutor, nor ally himself with the defense as an expert counselor.

Dr. Austin Flint, as Chairman of the Section of Criminology at the last annual meeting of the Prison Association of the State of New York, expressed the sense of the medical profession in advocating the establishment of boards of experts on technical subjects, to be paid by the county or by the State, which should act in an advisory capacity to the court.

The State Medical Society has endeavored to have a bill enacted providing for the appointment by the courts of experts whose function should be advisory, and who should adequately represent to the court their conclusions drawn from an impartial examination of both sides of the question at issue; the compensation for such services to be fixed at a reasonable rate by the court.

At the last annual convention of the Medical Association of Central New York the employment of experts by either side of a case was condemned, and remedial legislation was advised providing for a commission of experts to be appointed by the State or by the court, at a fixed compensation. Opinions were read from many justices of the Supreme Court of the State. All admitted the necessity of expert testimony, but agreed that the present system of obtaining it made it worse than useless.

A change in the statutes was favored which should require all medical testimony in a medico-legal case to be given by a commission appointed to examine all such matters brought be-

fore the jury at the trial. The plan provides that the medical experts in a case shall be appointed by the court, as referees are, and be paid by the county, without being allowed to receive fees from either the defense or the prosecution. This procedure should be broadened enough to include a similar method of appointing experts in all branches of scientific work wherein special professional skill is required.

MAY A LUNATIC BE SUED?—A case has recently been brought before the Court of Appeals of the State of New York which is of interest to an alienist. The question to determine was whether or not a lunatic may properly be made a party to an action at law. The case was that of Kent vs. West. The West brothers, three in number, were merchants and became badly involved, it is said through speculations in real estate, and employed Kent as their counsel. The agreement made, according to Kent, was that the attorney should save a certain amount—\$90,000—for the estate, and that he should receive as his fee all collected by him in excess of the sum stipulated. He succeeded, it is alleged, in saving about \$110,000, but when he demanded his reward of \$20,000 the brothers repudiated the contract. Previously one of the brothers had been pronounced a lunatic, and a committee had been appointed. After Kent brought action, an action was brought against him for contempt in suing a lunatic, to which he replied that he had a court order allowing him to sue. The court is to decide whether or not it is proper to sue both the lunatic and the committee, or only the committee.

STRICT COMPLIANCE WITH THE LAW IN THE COMMITMENT OF THE INSANE. THE CASE OF LEVI P.—This case is related to show the necessity which exists for the exercise of great care in the commitment of the insane. Precautions should be taken to comply strictly with the letter and spirit of the law, not only in civil but also in criminal cases. The imbecile son of a farmer was arrested upon a charge of aggravated assault, and, while awaiting examination, appeared to be insane. The law of New York in such cases prescribes that the county judge of the county where the person is confined shall institute a careful investigation, call two respectable physicians and other credible witnesses,

invite the District Attorney to aid in such examination, and, if it be satisfactorily proved that he is insane, such judge may order his removal to a State asylum, where he shall remain until restored to his right mind. It is further provided that the State Commission in Lunacy may, by an order in writing, transfer any insane inmate of a State hospital committed thereto upon an order of a *court* of criminal jurisdiction, to the Matteawan State Hospital. The prisoner upon examination was found to be insane and committed to Rochester State Hospital upon an order of the special county judge of Monroe County. The examination was held in accordance with the statute so far as to notify the District Attorney to be present and to aid, and two competent physicians were appointed who pronounced him insane. No other credible witness seems to have appeared at the hearing. Soon after his admission to Rochester he was transferred by the State Commission in Lunacy to the Matteawan State Hospital.

Upon a writ of habeas corpus for his discharge from custody, it was subsequently argued that in the first instance the commitment to Rochester was illegal for the reason that no *other* credible witnesses were examined at the proceedings instituted by the special county judge, and furthermore the order for the original commitment to Rochester having been signed at chambers did not constitute an order of a *court*, consequently his transfer to the Matteawan State Hospital was also illegal. The justice of the Supreme Court so held, and the patient was discharged from custody. As the man, however, was a lunatic, large and powerfully built and said to be a dangerous person to be at large, a chaser of women and children, sexually perverted, and a terror to the community, he was held for further examination. Upon a second certificate of insanity he was finally recommitted to the Rochester State Hospital as a civil case, the criminal charge having fallen, as the principal witness in the complaint had left the State. The case simply shows how easy it may be for a dangerous insane criminal to evade the provisions of the law for his safekeeping, unless the statute is most carefully and technically observed even to its smallest details.

A Quarterly Bibliography of Psychological Literature

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Half-Yearly Summary

The present SUMMARY is an almost unbroken record of medical progress. Of the twenty-two institutions included, two (Little Rock and Colorado) urge the pressing need of hospital buildings for the sick and infirm; at two (Montreal and Kalamazoo) hospital and infirmary wards are ready for occupancy; and in twelve (Napa, Georgia, Idaho, Catonsville, McLean, Kalamazoo, Newberry, Trenton, Newark, Buffalo, St. Lawrence, and Montreal) laboratories have been begun or are in contemplation. In other institutions some special features of clinical work are recorded. The equipment of these numerous laboratories for clinical investigation rather than for *post-mortem* study, is a noticeable feature, and is a healthy mark of the desire to expend the greatest effort upon the individual patient. That the demand for scientific work has been thus early diverted from pathological investigation to the study of the clinical manifestations of disease is a matter for congratulation. The establishment of a laboratory for the examination of the blood, the secretions and the excretions, is a comparatively easy and inexpensive undertaking, and one offering far better opportunities to the assistant physician fresh from college or the general hospital than the elaborate apparatus required for the elucidation of the intricate problems of cerebral structure and function.

In Michigan it is proposed to unite the State Hospitals with the State University at Ann Arbor, for the improvement of the medical service and for the development of pathological work after the manner inaugurated by the New York State Hospitals in their Pathological Institute. The suggestion has been well received by the University authorities. In his argument in favor of the proposed step, Dr. Edwards refers to the "criticism that asylum physicians soon get into routine ways, and are not benefited by the stimulus that comes from the sharp competition of those in general practice." The present SUMMARY is strong evi-

dence of the injustice of such criticism. It is doubtful whether reports at random from an equal number of general hospitals for the sick and injured would reveal a greater degree of well-directed and disinterested effort for the relief and welfare of their patients.

ARKANSAS.—*State Lunatic Asylum, Little Rock.*—Repairs to the amount of \$8000 have been made to the Insane Hospital at Little Rock, Ark. New tile floors and bath-tubs have been put in all the water-closets and lavatories, and new floors in three wards. Another boiler (75 H. P.) has been added to the engineer's department, electric lights have taken the place of the former gasoline gas lights, and the whole interior has been repainted and plastered. For the treatment of acute cases, one ward for each side has been set apart and is used. It is to be hoped that the next General Assembly will make provision for the erection of a hospital for the acute sick, apart from the main buildings.

CALIFORNIA.—At the last session of the California Legislature a new Insanity Law was passed and approved by the Governor. The main points of the new law, which are different from the old law and of general interest, are:

Provision for a State Commission in Lunacy, composed of the Governor, Attorney General, Secretary of State, the Secretary of the State Board of Health, and a General Superintendent, who is appointed by the Governor. This commission has general supervision of the State hospitals for the insane. The power of the commission does not interfere with or embarrass the control of the Board of Managers of each hospital.

The names of the institutions for the treatment and care of the insane have been changed from "Insane Asylums" to "State Hospitals"; the physician in charge is the medical superintendent. He must have had three years' experience in the care and treatment of the insane. The first assistant must have had two years' experience, and the second one year's experience in the care and treatment of the insane. The third assistant, the internes and all subordinate officers and employees are appointed by competitive examinations.

"The Board of Supervisors of each county shall provide for and furnish, at or in the city, city and county or receiving hospitals, a suitable room or rooms for the detention, board, care and treatment of the alleged insane." "In no case . . . shall such person be committed to any prison, jail, or lock-up for criminals and drunkards, nor shall he be confined in the same room with a person charged with or convicted of crime." The period of detention cannot be less than one nor more than twenty days. Medical examiners in each county are appointed by the Lunacy Commission, and the medical examination is prior to the legal, and is of chief importance—a complete reversal of the former methods.

It is provided that patients who have not acquired a residence in the

State prior to their admission to the hospital may be returned to the county or State to which they belong.

It is provided that uniform medical records shall be kept, the forms to be determined by the Commission.

—*Napa State Hospital*.—A residence for the medical superintendent is in process of construction, and two more are to be built for the first and second assistants, respectively. In the construction of these and all other buildings, the greater part of the labor is done by patients. The construction of these residences will render available for use of the hospital a large amount of space, which will be fitted up as operating rooms, a clinical laboratory, etc., which have heretofore been impossible because of lack of room.

COLORADO.—*State Insane Asylum, Pueblo*.—Regular lectures are given to attendants, who will be required to pass a final examination in their studies and in their practical work. No attendants will be retained who do not show satisfactory improvement. All new attendants who are engaged must be trained before entering the asylum, and if not graduates of some training school for nurses, must submit to an examination.

A staff of attending physicians have volunteered their services to visit the asylum at regular times and attend gratis any cases assigned them by the superintendent in their special departments.

The improvements during the last two years have been quite extensive; among the most important has been that of sinking a well at a convenient point for an additional water supply, and the removal of our pumping station from the river bank to the new point of supply. The saving in distance and the improvement in the quality of water have amply repaid the labor and expense incurred.

A new and excellent bakery has been constructed, which has proved a great help in the work of the culinary department.

The new cottage building for males, which could not be completed in 1894 for want of funds, was completed and occupied in September, 1895. The opening of these wards has made it practicable to receive all male cases for which application has been made during the past year.

In the last biennial report Dr. Thombs urges the need of a hospital entirely separate from the main buildings, where the sick and helpless can receive the care demanded by their condition. The room occupied by the sick is needed, and from every view it is the duty of the State to care for the sick in a separate building. The building should be modern and fully provided with appliances either for medical or surgical work. It should have a separate kitchen so that a dietary for the sick could be prepared in accordance with the needs of the patient.

GEORGIA.—*Georgia Lunatic Asylum, Milledgeville*.—Several wards have been set aside and especially equipped as infirmary wards. Bright, airy wards have been selected, and everything possible done to fit them for the intended service, and when the cottages for the assistant physicians

are completed the centre buildings of both male and female convalescent buildings will be converted into infirmary wards, and rooms in each building set apart for surgical work and thorough clinical examinations. The basements will be used for giving nurses special training in cooking for the sick, which will improve their service.

All cases of serious illness in these buildings will be at once removed to one of these wards, where special attention may be given them by nurses trained for this duty.

A course of lectures has been delivered to the white female nurses by the superintendent of nurses, with the result of greatly increasing the efficiency of the service, as evinced by greater interest and intelligence shown by the nurses in general in the discharge of their duties and in their attitude towards patients. The subjects taught have been anatomy, physiology, the general work of the sick room, chart making, and the recording of data relating to the condition of the patients, etc. The textbooks used are "Domville's Manual for Hospital Nurses" and "Handbook for the Instruction of Attendants on the Insane." Throughout the year weekly lectures have been delivered by the physician in charge to the nurses of the colored female department. The subjects touched upon were anatomy, gross and minute, physiology, bacteriology, mental diseases, bandaging, preparing surgical dressings, and the keeping of charts and records at the bedside. Special cookery for the sick is to be taken up.

Several rooms have been fitted for surgical work. Two aseptic operating tables and many necessary instruments have been purchased, in order that such operations as may become necessary through accident, or which are expedient for the welfare of the patients, may be performed under modern aseptic precautions. The end in view is to finally provide performance of the most delicate and serious tasks in the field of surgery, in order that patients may be given the benefit of any aid which this branch of medicine may offer. Several major operations have recently been satisfactorily performed.

Segregation of all cases of pulmonary tuberculosis has been carried out in the female colored department, and all possible precautions taken towards disinfection of sputum and the rooms occupied by this class. A separate court for open air exercise will soon be prepared for them. The result of this procedure only time can demonstrate, but it is hoped thereby to lessen the alarming mortality from this cause, which, among the female negro insane, reaches its highest limit. The sputum of suspects is immediately submitted to microscopical examination and steps taken according to the findings.

A suitable room, with illuminating apparatus, has been arranged in order to facilitate laryngoscopical and ophthalmological work, and satisfactory examinations of the throat and eyes can now be made.

The annual report of the asylum contains an interesting report by the pathologist, Dr. T. E. Oertel.

IDAHO.—*The Idaho Insane Asylum, Blackfoot.*—Dr. John W. Givens has

been reappointed to the superintendency. There are now one hundred and seventy-five patients and twenty-two employees in the institution. A clinical laboratory is being fitted up.

The planning and work of a few years ago for the asylum farm (there are two thousand acres in the farm) is now giving good results. The orchard is beginning to bear, and in a few years will produce all the fruit needed in the asylum. The herd of cows is now producing a little over seven hundred pounds of milk, and making twenty pounds of butter per day. All of the hogs and hog products needed are produced, and Dr. Givens is quite a believer in Beard's doctrine that the American hog is one of the best antidotes for American nervousness.

MAINE.—*Eastern Maine Insane Hospital, Bangor.*—The Commission upon this new institution have appended a preliminary report to that of the Maine Insane Hospital at Augusta.

The contracts so far made and partially completed include the general construction of central buildings, without plastering or interior finish; the general construction of the domestic department (kitchen, laundry and boiler house), with a part of the interior finish. No plumbing, heating or electric work could be included in these first contracts, owing to the limited amount of money available.

The stone obtained by the grading of the lot has been utilized in the construction of the domestic department buildings, foundation walls for all buildings, and in the roads.

A fine spring of water has been found upon the lot and has been walled up. This water is pure, clean and soft, and as there is evidence of an abundance of water in the hill, the Commissioners are seriously considering the advisability of drilling an artesian well for the purpose of obtaining an adequate and pure supply for the hospital.

In all the work so far contracted for, and in the details of work to be done in the future, the Commissioners have guarded the interests of the State, and while everything is to be done substantially and well, no extravagances have been allowed to creep in. The work so far executed has been well done and to the entire satisfaction of the Commission, and if future contracts shall be as well carried out there can be no criticism of the strength and durability of the buildings.

—*Maine Insane Hospital, Augusta.*—In their annual report the trustees make the following note upon the criminal insane:

"The Insane Department of the State Prison at Thomaston in a measure satisfies the demands of the criminal insane for humane treatment, and removes the objection of bringing that class in close contact with the worthy but unfortunate insane citizens of the State. It has, however, come to our attention that the courts of the State do not recognize the right of sending men to the insane department at Thomaston for observation, even when charged with high crime, when the plea of insanity is set up by the counsel for defendant; but now send such inmates of our jails to the Maine Insane Hospital. Dangerous and crafty

prisoners, suspected of crime, have been lodged in our State Hospital, with results of a very objectionable experience. An adroit and nearly successful attempt was recently made to escape by one of these suspected criminals, placed at our Hospital "for observation" by order of the court, which not only endangered the life of himself, but that of the attendants. It seems to the trustees that such persons should be sent to the insane department at Thomaston, or that a suitable building or apartments should be erected or provided at Augusta for the accommodation and safety of this character of patients, while under the observation of the superintendent; and we ask for a suitable legislation to bring about this result."

Dr. Sanborn sends the following communication to the SUMMARY: "An additional physician was employed on the medical staff the first of July, and the staff now consists of a superintendent and four assistants, one of whom is a lady physician. No epidemics of any character have prevailed, and an unusual degree of health has pervaded the entire institution. We have been quite occupied in the construction of a new power-house and the setting of new and larger boilers, in which are introduced the Hawley system of heating. We took precaution to construct sufficiently large so that we can in the future generate our own electric current, which is now being supplied from the city plant. It may be of interest to add in this connection that we have made a new departure, in that we have erected a chimney on a very much larger plan than the existing old one, the flue of which is six feet five inches in diameter, and one hundred and eighty feet high, the boiler-makers insisting that this would give the best practical results and materially lessen the consumption of fuel. It may possibly be of interest to the management of other institutions to know that during seven months of the year the institution receives its heat from the Augusta Lumber Company's plant over twenty-five hundred feet distant. It is found entirely practical for materially lessening the cost of heating, and is of pecuniary benefit to the mill owners as well, inasmuch as they can consume their sawdust and all refuse material, which could not be disposed of in any other way and would be entirely worthless."

MARYLAND.—*Maryland Hospital for the Insane, Catonsville.*—Since the last statement made by the JOURNAL, many valuable and necessary improvements have been made. An electric-light plant has been established, taking the place of the gas; new hard-wood floors have been laid in nearly every ward in the hospital; a new and improved system of locks has been added; the entire woodwork of the building has been repainted. An increased effort has been made to give suitable employment to as many of the patients as possible. With this object in view a shoe shop has been opened and eight men trained in this line of work. A tailor shop is contemplated, and will be started as soon as a suitable building can be erected. The fire house has been enlarged and additional apparatus added; a pathological laboratory, under the direction of Dr. Cornelius Deweese,

has been established, and careful examination is made and records are kept of the blood, urine, sputa and secretions. Special work has been done looking towards the restriction of tuberculosis in the hospital. Efforts in this direction were rewarded last year by a decided reduction of the death rate from that disease. Isolation has been rigidly enforced; careful disinfection of all clothing, bedding and such articles as were in contact with the patients has been carried out, and constitutional treatment has been adopted in every case. The hospital now contains 510 patients, the largest number in its history.

MASSACHUSETTS.—*McLean Hospital, Waverly*.—The following extract is made from the Annual Report: "The voluntary cases were six more than one-third of all admissions. . . . A large proportion were, as usual, cases of melancholia. The summary of the medical work of the year shows some notable effects resulting from the circumstances attending the transfer of the patients from Somerville to Waverly late in the previous year. By the removal of chronic cases, room was made for recent cases in the new hospital, and the number of admissions to it, in its first year, were fully equal to the average at Somerville. But the care exercised in granting the privileges of the hospital to the more strictly recent cases, as having the stronger claim, caused a material increase in the proportion of this class. It is noteworthy, in this regard, that the movement of the hospital population showed increased activity; on the basis of a daily average of 138 throughout the year, there were about as many changes of patients coming and going as when the usual average was 175. There is a special significance also in the fact of the tendency to let convalescing patients go home earlier on trial; in this fact is manifested one of the beneficent results of the better conditions afforded by the new hospital. The patients are, doubtless, so influenced by the improved comforts and attractions of the new houses, within and without, as to permit greater freedom in granting the liberty of the grounds; the tests of self-control can be sooner applied, and, while these are naturally contributing to the curative influences, the convalescing patient earlier shows self-reliance and trustworthiness.

"Some progress has been made in developing the methods of clinical work in connection with that of the laboratory with its facilities for investigation. While Dr. Hoch has pursued his studies and demonstrations in anatomical pathology, which should never be neglected in a hospital of this kind, the work of a clinical laboratory has also been carried on. The studies of special problems undertaken by the internes are represented by a paper published by Dr. Capps at the beginning of the year, entitled, 'A Study of the Blood in General Paralysis'; and another by Dr. Hibbard, on 'A Study of Urea and Uric Acid in Melancholia,' is expected soon to appear. Dr. Burrows is about to complete 'A Study of Leucocytosis associated with Convulsions.' Besides these special subjects, the work in medical chemistry is maintained for current clinical purposes.

"The clinical conferences were continued twice each week during the

year, which amounted to careful consultations by the medical staff upon every case admitted. The substance of these discussions was recorded, together with the diagnosis and prognosis. Upon the discharge of every patient, also, the case was reviewed and the conclusions of the original discussion tested by its hospital history and termination. This method is proving to be most instructive and valuable in the better understanding that is being gained by the more precise discrimination of different forms of mental disorder, by the better appreciation of the data for prognosis, and by the indications for treatment.

"While the medical work of the year has been going on under favoring conditions, it was a time of adjusting and perfecting the business organization of the hospital. This has to wait upon the completion of the construction, in many details, in respect to minor arrangements and appliances which are still of material importance for ease and economy of administration. Progress must be slow in carrying on these processes, but they are now so far advanced, as regards the most essential matters, that more attention can be given to those refinements which make a habitation homelike and attractive.

"The gymnasiums for men and women will soon be occupied for recreation, exercise, and work in the shops. But in anticipation of having properly adapted places for these purposes, much has been done to develop the long contemplated plans.

"Exercise for its direct remedial effects in the form of physical training, by general and medical gymnastics, including outdoor exercises, has been directed by the instructors in physical training—by Mr. Skarstrom for the men, and Miss Hurlbutt for the women. The indoor facilities for gymnastics were limited, being confined to the occasional use of the new entertainment hall for the men, so that much attention was given to outdoor exercise for them. In one of the gardens there was arranged what was practically an open-air gymnasium.

"Exercise was joined with recreation in various games, such as quoits, croquet, tennis, golf, base ball, and 'medicine ball.' Some labor was performed in stated daily tasks in the care of tennis courts, croquet grounds, golf links, flower beds, etc. In its season there was skating, which was enjoyed by ten patients, and walking excursions were popular during spring and summer. The class in wood-carving deserves special mention.

"The nurses receive, systematically, instruction in gymnastics as a part of their training; this enables them to aid in applying this form of treatment for the benefit of the patients. The nurses, both men and women, have the advantage of the new school kitchen for instruction in cookery and in the serving of food. Every woman nurse spends twenty-five forenoons in the kitchen in the presence of the instructor, Miss Brandt, who has the supervision, also, of the work in all the patients' dining-rooms, and the house kitchens, of which there is one for every house. With these facilities, the dietary has been greatly improved in quality and variety as the result of study and experiment during the year."

MICHIGAN.—At the meeting of the Joint Board of Trustees of the Michigan Asylum, held at Newberry, July 15, 1897, Dr. Edwards presented a paper on "Pathological Work in our Asylums." Dr. Edwards proposed an affiliation of the several State asylums, including that for Dangerous and Criminal Insane, with the State University at Ann Arbor.

This plan, to be hereafter elaborated and completed for the co-operative study of mental disease by the several asylums in conjunction with the pathological department of the University, would obviate the necessity of employing a skilled pathologist, the erection of laboratories or any marked or considerable expense. It would be necessary that the work be laid out systematically and placed under the direction of the professor of pathology of the University and a committee from the Asylums. Each institution may pursue some definite line of study of its own selection or that may be appointed for it by a committee having the matter in charge. Our junior assistant physicians, or those of them who are specially interested in such work, could be directed from time to time to spend a week or two or more at Ann Arbor in the study of the technical methods of staining and mounting tissues, and in the study of bacteriology and other topics that might arise.

In this way they not only would be benefited by the actual information to be obtained, but would be brought closer in touch with medical thought and progress as expounded at the University, which is the accredited mental centre of the State, and thus obviate the criticism that asylum physicians soon get into routine ways and are not benefited by the stimulus that comes from the sharp competition of those in general practice.

Dr. Edwards read a letter from Dr. Vaughan, dean of the Medical Department of the University of Michigan, expressing hearty approval of the proposed plan. A committee was appointed to confer with the University.

—*Michigan Asylum for the Insane, Kalamazoo.*—The hospital for paralyzed, bedridden and generally infirm cases in the male department is completed and ready for occupancy. It accommodates one hundred patients and provides room for the necessary nursing staff. The superstructure is of brick, built upon a foundation of Ohio stone extending ten feet above the grade; interior finish of hard wood and walls plastered. The building is lighted by electricity, and heating and ventilation are provided by the fan system, the heat coming from the central plant and is controlled by the Johnson electric automatic regulating device. The details of construction and interior arrangement conform to the special purpose of the building.

The detached building on the female side for the reception of new cases and the treatment of curable forms is in course of erection and will be completed within the coming year.

The residence for the assistant physician in charge of Fair Oaks Colony is well under way.

A general dining room for convalescent and comfortable cases on the female side was built this summer and is now in use. It is one story,

brick, on a stone foundation, floor is of tile and the walls plastered. It is adjacent to the kitchen, connected by a covered way, and will accommodate about two hundred patients.

Medical.—No new therapeutic agent has found especial favor with the staff during the past year, but there is a deepening in the feeling of the utter insignificance of drug therapeutics as compared to remedial effort by means of diet, sleep, exercise, occupation, electro- and hydro-therapeutics, etc. An accessible and well appointed laboratory has been provided, as well as a surgery and an examination room. The examination of patients has been arranged in four departments: 1. General appearance and anthropometrical examination. 2. Physical examination. 3. Physical examination (micro-chemical). 4. Neurological and physical examination. Each of these divisions is in charge of an assistant physician who gives that particular subject his special study and, when the examination is completed, the case is presented at the daily staff meeting, when there is a comparison of reports, and if possible, diagnosis, prognosis and treatment are decided upon.

The general health in the institution has been particularly good during the past year, there being comparative freedom from acute physical disease of any kind and a dearth of accidents.

The training school work is resumed to-day with an enrollment of 75. Lectures and ward demonstrations are given every day, and we feel that our efforts are well repaid in the increased efficiency of the nursing staff.

—*The Upper Peninsula Hospital for the Insane*, located at Newberry, Michigan, opened November 1, 1895, which is the only one in the State built on the "Cottage Plan," has now about two hundred and fifty patients under treatment. In December of last year two cottages were completed, one a cottage for disturbed patients, and the other a large infirmary for both male and female patients; in the first story, in addition to a ward for male patients, is a suite of rooms for reception and treatment. Here are two electrical machines, a Van Houten and Ten Broek static and a Ranney forty-four cells combined faradic and galvanic. The second story is devoted to female patients, and in the third are the operating rooms, fitted up with tile flooring and a dome-shaped ceiling of glass so arranged that the light falls where it is most needed. This room is furnished with an improved Boldt operating table and other necessary appliances, all of the latest models. Adjoining this room is another room expressly for anaesthesia and massage.

At present there are under construction a central kitchen and dining-room to accommodate five hundred patients, and a cottage with a capacity for fifty male patients. The buildings are connected by cloisters, and all patients who are able will congregate in this dining hall for their meals. The buildings are constructed of pressed brick, in the most substantial manner. The hospital is under the management of Samuel Bell, M. D., medical superintendent, formerly of Detroit.

—*The Oak Grove Hospital at Flint* has been doing some creditable X-ray work. Dr. Burr sends to the SUMMARY a photograph of a bullet located

in the hand of a boy. The case in the practice of a physician in Flint subsequently came to successful operation. The picture is a most creditable specimen of X-ray work.

MINNESOTA.—The last Legislature, by reason of the division into two parties, each favoring its special town as site for the fourth State hospital, finally adjourned, no site or appropriation having been determined upon. Thus the "crowding" of existing State hospitals continues, the extended accommodation at Fergus Falls only to a slight extent taking up the surplus.

As a side result of the failure of the Legislature to provide, there arose a few advocates of the Wisconsin system, and a study of that system is provided for. The best judges, however, do not seemingly favor such plan.

A law was passed providing for a re-examination of the present hospital population, and a decision in regard to any that might be cared for outside easily and without danger, by virtue of which they could be forcibly sent back to relatives or to the counties. This is just being put into force. An indirect (and probably unintended) result is to revive the county poorhouse care of insane, so strongly condemned a few years ago, for the tendency even now noted is to select the pauper harmless demented. The more wealthy population have largely sent their relatives for good cause, and doubtless will have influence to keep them or return them to the hospital.

Another law was passed providing the returning of the non-resident insane to their proper residences. This brings up some complicating circumstances, as families moving into this State from other States would not be considered residents or entitled to accommodations in the State hospital under one year. It is thought that the non-residents of the State committed to the hospitals will be about evenly balanced by the residents who will have been committed in other States, and a general system of exchange would merely result in the cost of transfer and added labor, without decrease in the population of the State hospitals.

—*The Rochester State Hospital* is now being wired for electric lighting, and the only building of the year is the building made necessary for this purpose.

NEW JERSEY.—*New Jersey State Hospital at Trenton*.—Dr. Ward writes: "A laboratory for pathological and bacteriological work is nearing completion. The building is being erected for this especial purpose, and will be separate and apart from the wards of the hospital. When completed it will be about forty feet square, one story in height, and will be divided into four rooms—one for autopsies, one for chemical analysis, one for microscopical examinations, and one for photography and micro-photography. Dr. H. M. Weeks has been appointed by our board of managers as the pathologist and bacteriologist of the institution. He comes to us well prepared for the work, having had considerable experience, both in this country and in Europe, in this line of work.

"At the coming session of the Legislature an effort will be made to get the State authorities to do something toward the establishment of an epileptic colony, and toward the erection of a special building for insane convicts. This has long been needed, but notwithstanding the earnest efforts made during the past three or four years before the Legislature to have them do something in this direction, thus far it has been a failure."

Since the last SUMMARY, Dr. Kirby, senior assistant physician, died suddenly after a very few hours' illness from angina pectoris. Dr. Ward writes the following tribute: "Dr. Kirby had been with me for a period of twenty-one years. He was my preceptor about thirty-five years ago. Having been with me so long in the work here, his death is not only a great loss to the institution, but to me personally as well." "The vacancy caused by the death of Dr. Kirby has been filled by the promotion of Dr. John C. Felty from the position of second assistant physician to that of senior assistant. Dr. Weeks takes the position of second assistant and pathologist. The position of fourth assistant, which has been so long vacant, was filled in June last by the appointment by the board of managers of Dr. Paul L. Cort, who comes well prepared for the work. Prior to his appointment he was resident physician of Mercer Hospital in Trenton.

"At the close of the month of September, ten hundred and sixty-four patients were under care in the institution."

—*Essex County Hospital for the Insane, Newark.*—Among the therapeutic results summarized in the last report are the following:

The combination of sulfonal and trional in equal parts (grs. 10-15) has proved very efficient in excitable cases and persistent insomnia, the slower hypnotic action of the former sustaining and prolonging the earlier effects of the latter in the combination. Occasionally codeine, gr. $\frac{1}{4}$, $\frac{1}{2}$, enhances the effect of the other two. The Fleschig method of treatment of epilepsy, after diligent experiment, was found to be wanting in curative results. Explosions of the status epilepticus supervened in the majority of cases and bromides were resorted to in the usual doses to save life. The hydrocyanate of iron has also been given some trial in the treatment of epilepsy. Four cases are given in which the hydrocyanate was administered in half-grain doses. One patient appeared to be benefited, the number of convulsive seizures being reduced about one-half. In two other cases the improvement was doubtful or temporary, and in one case the epileptic seizures increased. The administration of thyroid to one patient was accompanied by progressive mental improvement.

The report of Dr. Hicks, the pathologist, is appended to that of the superintendent.

During the past year the laboratory has been utilized in six distinct fields of usefulness: 1. Urinary analysis; 2. Examinations of sputum, discharges, etc.; 3. Examination of blood; 4. Analysis of milk used by the hospital; 5. Microscopic examination of tissues for the twofold purpose of diagnosis and study; 6. Instruction of members of the Training School for Nurses in elementary histology and bacteriology.

The urine has been subjected to complete analysis chemically and the urinary deposits to a most careful microscopic examination in seventy-two cases. Urea was increased in nine and decreased in sixteen cases, and was therefore normal in amount in forty-seven.

The chlorides were persistently low, especially in the acute forms of insanity. In these cases where the chlorides were low the specific gravity was prone to be high. Patients suffering from acute mania or melancholia often take little water or none at all, and must be fed mechanically. They, therefore, often get insufficient fluid and salt. When the urine is concentrated and the chlorides diminished under such circumstances, the patient in many cases may be greatly benefited by adding salt to the prepared diet and by giving water several times a day. Indican appears to be increased most frequently in the acute insanities. Albumen in varying quantities, from a mere trace to thirty per centum, was found in twenty cases. The form of insanity seems to exert little influence in the production of albuminuria. Fifteen of the twenty cases of albuminuria were the results of nephritis, demonstrated by the presence of granular and hyaline casts in the urine.

The acetones appeared in conjunction with either glycosuria or acute febrile processes, pneumonia and phthisis. Acetones were found in the urine of a patient who subsequently died of carcinoma of the liver, breast, lungs and pelvic organs. Peptones were also found in this case.

The phosphates were increased in four cases, two of acute mania and two of acute melancholia. Sulphates were increased in one case—dementia paralytica. Oxalate of lime crystals were found in ten cases, all of which appeared to be physiological except two, cases of true oxaluria in acute melancholia. Spermatozoa were discovered in two samples of urine, both from patients suffering from acute melancholia.

The microscopic examination of the sputum has been utilized in differential diagnosis in lung diseases; consumption, bronchitis and pneumonia.

The blood has been examined in a few cases for the purpose of ascertaining the quantity of hæmoglobin, the ratio of leucocytes to erythrocytes and the character and condition of the corpuscles. A differential count has seldom been resorted to.

The milk used in the hospital has been analyzed from time to time. These tests have been made according to the German method by means of Von Feser's lactoscope, Quevenne's lacto-densimeter, Chevalier's creamometer, thermometer, and iodine solutions; the results verified by the color test and confirmed by the residue method.

Sections of tissue from the various organs of the body have been prepared and mounted for microscopic examination in a few cases of obscure or doubtful conditions, chiefly for purposes of diagnosis. The preparation of sections for permanent mountings, involving elaborate details of technique, has been largely crowded out by other work of greater clinical importance.

During the year twenty-four autopsies have been made and recorded.

The brain was examined in fifteen of these cases. Lesion of the skull bone was found in six cases, of the dura mater in five, of the pia mater in eight, of blood-vessels in six, and of the brain substance in two. There was cerebral hemorrhage in three cases, asymmetry in one, convolitional atrophy in two and general atrophy in one. Three cases presented no gross lesion of the cranial contents.

The thoracic, abdominal and pelvic organs were examined in twenty-one cases. There were morbid conditions of the lungs in seven cases: two of lobar pneumonia, one of carcinoma, and four of phthisis; of the pleura in seven, the pericardium in two, the heart muscle in four, the cardiac valves in four. In nine cases the kidneys were diseased, the liver in one, the stomach in one, the bladder in three, the prostate gland in one, and the peritoneum and intestines in three. Tuberculosis existed in four cases, or nineteen per cent.; kidney disease in nine cases, or forty-two per cent.

NEW YORK.—*Utica State Hospital.*—The Utica State Hospital has erected a coffee-roasting and spice-grinding plant. It is a two-story building, equipped with the most modern machinery. The intention is to roast at Utica all the coffee and grind all the spices used by the State hospitals. In this way it is hoped that there will be a gain with respect to economy and quality of coffee and spices. The building and equipment cost about \$5000.

In this connection, interesting experiments have recently been conducted in regard to the saving of coffee and improvement of its flavor by fine pulverization. The Willard Hospital has figured a saving of about 25 per cent. by this simple means. Coffee is made by percolation through cotton in specially constructed urns.

The water supply of the Utica State Hospital, which has always been a matter of great solicitude, has been greatly improved by substituting a brick conduit with flag bottom for the eighteen-inch vitrified pipe which entered its reservoir. The hospital spring is situated about a mile from the building, in wooded land. It was found that willow roots had entered the vitrified pipe and choked it up effectually for its entire length.

The new agricultural colony at Graycroft, about a mile from the hospital, has proved a great success. About twenty patients have been maintained there, doing profitable work all summer as farm laborers.

—*Buffalo State Hospital.*—The new group of infirmary buildings, soon to be opened, contains one feature which is somewhat unusual in asylums for the insane, and promises to be of marked utility, viz. a clinical amphitheatre and operating-room. It has been the custom for a number of years to hold weekly clinical lectures on insanity during the school year, for the students of the medical department of the Buffalo University and Niagara University. The lectures heretofore have been given in the wards or in the chapel, and under disadvantageous circumstances. This new amphitheatre, which rises two stories, has abundant light, has a seating capacity for about 150, and will be extremely useful for this

purpose, as well as for the lectures in the training school for nurses, and for an operating-room when necessary.

The infirmary building is designed to care for the new admissions, and for the acutely sick, and, being fitted with convenient laboratories, every care and study can be given to the recent and curable cases. The wings are for the helpless and infirmary class, and patients in all stages of mental disease can be supplied for the lecture-room.

But few hospitals for the insane are located in or sufficiently near cities to make clinical teaching of insanity available to the classes in medicine, but the situation of this State hospital makes it convenient to carry out this very desirable branch of medical education, and it is gratifying to know that the needs of medical education in this instance are being met.

—*St. Lawrence State Hospital.—Training School.*—In spite of the more rigorous entrance examinations and increased requirements for graduation, the year has been a prosperous one for the training school. Out of a senior class of 15 who took the State examination conducted by superintendents, 14 passed successfully. 66 candidates took the examination for entrance to the junior class of '96 and '97, but the close of its session found its number reduced to 33 members, a reduction of about 50 per cent., which was brought about by failure of the candidates at midwinter and final June examinations, and the elimination of the unfit by their voluntary or forced resignations. 28 of the successful members of last year's junior class form the senior class of this year. For the junior class of '97 and '98, 33 candidates presented themselves at the examination conducted by State hospital superintendents. Of this number 25 passed successfully. The plan of having a few lectures delivered by outside physicians lends interest and adds dignity to the course. Greater attention is paid to practical ward instruction, bedside teaching, observation of symptoms and extended attendance upon the sick.

A separate pathological laboratory has been equipped and located in the mortuary, which was completed for use in May, 1897. Preservation, section cutting and complete indexing of specimens are carried out in conformity with the methods of the State Pathological Institute. The room formerly used for the general laboratory purposes has been improved by changes in the interior which more than double the working space. It is now devoted entirely to investigations in physiological chemistry and bacteriology. Its proximity to the wards for acute cases renders it particularly well fitted for its purpose, as fluids for analysis can be brought out at any hour and cared for without delay. New apparatus and instruments have been purchased and its equipment is modern and adapted for experimental work, particularly in urine, stomach contents and blood. All of the specimens and instruments pertaining to the pathological department have been removed to the new laboratory.

With increasing experience we have found it advisable to devote more and more time and attention to new admissions. In addition to the ordinary examinations given all new cases, we have begun a routine

examination of the blood, which includes cellular elements and hæmoglobin, and the eyes and teeth of all new patients are examined by a competent specialist for sources of irritation and correction of diseased conditions. Calisthenics and physical training, particularly for the male patients, have been found a very beneficial measure in convalescent cases. Two or more classes are formed and patients admitted to the classes in accordance with their physical condition or need of exercise. In proper cases surgical work of an elective nature continues to be promptly carried out.

The female nursing staff on our male convalescent and sick wards has become indispensable. A convalescent male ward of 50 paroled patients is cared for satisfactorily by three female nurses. All of the nursing upon male sick wards is done by female nurses without an increase in the ratio of nurses to patients and with little assistance from male attendants.

Thyroid treatment continues to give good results in our hands in properly selected cases. During the year 24 cases have been under treatment, with two complete recoveries and several improvements. Since the introduction of this treatment here, recoveries from its use number eight all told, and we now consider it an indispensable adjunct to the therapeutics of insanity, particularly in cases bordering on dementia.

Tuberculosis.—Our herd of milch cows has been tested for tuberculosis and a large proportion found to be diseased. It was first discovered in a cow which was killed in January for beef, and the tuberculin test was immediately applied to the entire herd. Of 111 cows so tested, 49 were condemned. These were isolated for three months and re-tested without showing any of them to be free from the disease. Subsequently 44, which had given negative results, were re-tested and 7 were condemned. The diseased animals were slaughtered and the carcasses converted in the rendering tank into suet and fertilizer. The herd was housed in new and well-ventilated stables and was, to outward appearance, sleek and healthy. The disease was located in the mediastinal lymph nodes, intestines, lungs, liver and udder, in frequency in the order named. The tuberculin test has proved, in our experience, to be an accurate one; in no case where the reaction amounted to two degrees did we fail to find tuberculosis upon autopsy.

The Farm Cottage, situated south of Group Three, is nearing completion and is expected to be occupied early in the spring. It provides accommodations for forty patients engaged in agricultural work, and is admirably situated at the entrance to the farm and very near the barns. For the convenience of this building, the sewer has been extended from Group Three a distance of 1800 feet. The new milk house is also nearly finished and will be occupied in a few weeks. This is a one-story building, a short distance from the barns upon the principal thoroughfare, where the milk will be cleaned by the centrifugal method and Pasteurized before it is distributed for use to the several dining-rooms. Its equipment will include an outfit for cleaning cans by steam. Four additional boilers of the Fitzgibbons pattern, 150 horse-power each, have been

installed in the boiler house. A new direct-connected generator and engine have been added to the equipment of the electric-light plant. This was made necessary by the needs of the recreation building and several smaller buildings that have been put up within recent years. The improvements on the grounds have gone on as rapidly as possible during the summer in conformity with the general improvement plan, and a number of walks and lawns have been made and several drive-ways and approaches macadamized.

NORTH CAROLINA.—*The Eastern Hospital, Goldsboro.*—Last fall a four-story building was made ready for occupancy to accommodate ninety female patients. This building is now full, and more room is urgently needed for the accommodation of both male and female patients. During the past summer a new brick building was erected for the accommodation of our ventilating and heating apparatus, and almost the entire engineering work of the institution has been reconstructed, greatly to the benefit of the hospital.

The effort of the last Legislature to place the three hospitals for the insane under partisan management was foiled by the action of the Supreme Court, to which tribunal the authorities in charge appealed.

Each year adds testimony to the fact that lung degeneration is largely on the increase among the insane of the colored population.

PENNSYLVANIA.—A State hospital for the criminal and convict insane was recommended by the grand jury in its final presentment for the October term of court. In accepting the presentment and discharging the jury, Judge Gordon said:

"There is only one suggestion in your presentment that calls for comment from the Court, and that is your recommendation for the removal of the insane from the Eastern Penitentiary. Your action on this subject is important, and will have valuable effect in consequence of its cumulative force, it being the third recommendation of similar import within a year.

"Let me say that the law for the removal of these unfortunates from prison to insane hospitals is clear, adequate and mandatory. It is not necessary for me to fix now the blame for the failure to obey the law. That it is not obeyed, and that its enforcement is obstructed, is notorious and discreditable. It is not the fault of the law, however. It cannot be made a reproach to the statutes, for I say to you that for 75 years the law has provided for and required the removal of all insane from the penitentiary to State hospitals. In this regard there is no obstacle to carrying out the dictates of humanity but the wilful resistance to law of those in power.

"And, gentlemen, there ought to be incessant agitation upon this subject until a permanent and effective reform is provided. It is sad beyond expression that a prisoner sentenced to deprivation of liberty should have his reason also taken from him by his environment or other causes

and no hand be stretched out to succor and relieve him. Such unfortunates have the first claim upon the State for humane treatment. If they become insane while the State has them in its charge undergoing punishment, it is unspeakably cruel to inflict further punishment upon them while in such a sad condition. To take a sane man from court to prison, keep him there until he loses his reason, refuse to treat him humanely afterwards, and at the expiration of his term to turn him loose upon the community a mental wreck, is a crime against the prisoner, against society, and a glaring violation of the law.

"I am glad you have taken occasion to make the recommendation you have upon this subject. It shows that the proceedings touching the matter during the past year have not fallen to the ground worthless, but that they have borne fruit in the community. I sincerely hope they may take deeper root and ground until the spontaneous humane impulses of the mass of the community, unhardened by official pride and callousness, will compel an effective redress of the evil. You have done well to add your voice in condemnation of a practice that outrages humanity."

—*State Hospital for the Insane, Warren.*—The wards of this hospital have been greatly overcrowded during the whole of the year, but more particularly during the last few months, so as to compel the issuing of the following circular:

"The State Hospital for the Insane at Warren, Penna., was constructed and organized for the care and treatment of the insane of the counties of Warren, Crawford, Erie, Mercer, Venango, Clarion, Forest, McKean, Elk and Cameron, and Potter was afterward added by legislative act.

"The number of insane from these counties on the first of August, 1897, was 688; private patients from different sections of the commonwealth, 83; from twenty-four counties outside of the district, 264; making the total 1015; showing a very much overcrowded hospital. The capacity of the hospital when constructed was considered to be for 700 patients.

"The law requires that 'while the finances of the State do not permit ample provisions for all cases of insanity, recent cases shall have preference over those of long standing.' In order to meet this requirement of the law, it is respectfully and earnestly requested that before making arrangements to bring a patient to the hospital, a statement be sent to the superintendent, giving the sex, age, length of time insane; the first symptoms, dating back not longer than six months; any previous attacks; any complications that may exist, such as paralysis, epilepsy, or alcoholism.

"No patient will be admitted unless these requirements are fully complied with; the question simply being whether this provision of the law shall be complied with; or the hospital completely closed to any further admissions, and the closing of the hospital is not a thing to be desired."

The general health of the household has been good. The trustees in the spring purchased a farm of nearly two hundred acres, with good buildings, which have been arranged with special reference to the accommodation of a number of patients who will devote their time to the im-

provement of the farm. The number of patients who can be comfortably accommodated will be fifteen. It will be the Farm Colony of this hospital.

—*Pennsylvania Hospital for the Insane, Philadelphia.*—The detached block known as the North Museum building has been occupied during the year by a group of women under the leadership of one of the patients' companions, three afternoons of each week, alternating with the meetings of the pottery class in the South Museum building. The room is attractively furnished and supplied with a number of magazines and pictorials. It affords facilities for many quiet hours spent outside of the wards, in an agreeable, home-like manner, with some of the accompaniments of social life commonly observed outside of a hospital. Every afternoon and evening of the week has a fixed arrangement and opportunity for diversion, occupation, or instruction.

At the Department for Men, the swimming-pool and baths is a place of daily resort for the pleasure and refreshment it affords. The special baths are frequently prescribed by the physicians, and have come to have a place for the medical treatment of melancholia, nervous exhaustion, and toxic conditions. The number of baths given weekly averages 300.

—*Friends' Asylum for the Insane, Frankford.*—The Home for Women Nurses is now completed and furnished and will soon be occupied. By action of the board, it has been named Elmhurst. It is located near the west end of the main building, which is used for women patients. Dr. Winter's quarters are on the first floor and the rest of the building is for the use of the women nurses, with the exception of two suites which may be utilized for patients.

The house is built of buff brick, is three stories in height, and is an attractive addition to the group of buildings. It is heated from our central plant, a new boiler of 125 horse power having been added for this purpose. There are three open fireplaces on the first floor and one on each of the upper floors. It is wired for electric lighting and a contract has been made with the Suburban Electric Light Company to supply the electricity. A useful feature of the building is a fire-proof room, built in the basement, in which may be stored the archives of the institution.

—*School for Feeble-Minded, Polk.*—This institution was formally opened on the afternoon and evening of September 23, 1897. Simple dedicatory exercises were held, and it is estimated that about three thousand visitors inspected the grounds and buildings during the day.

Polk is a hamlet of a half-dozen houses on the Lake Shore & Michigan Southern Railroad, six miles from Franklin, and twenty-five from Mercer. The location, somewhat inconvenient as to access, is otherwise a perfect one. The tract of land purchased—870 acres—will prevent any future crowding or shutting in, and can be utilized in developing ability for farm work among the pupils. The agricultural products will also add largely to the resources of the school. The water supply is exceptionally pure in quality, and practically inexhaustible in quantity. It is brought by

gravity from mountain springs two miles distant, and from an elevation of 190 feet above the establishment.

The buildings are plain and substantial, little money having been lavished on mere ornamentation. But they are artistic, in harmony with each other and with the landscape. They are of the Norman style of architecture, and arranged on the "family" or "cottage" plan. They are grouped on each side, and to the rear of the principal or administration building. In the latter are the offices and private rooms of the superintendent, the directors', steward's and bookkeepers' rooms, the library and reception rooms.

The buildings are all considered fire-proof, are built of brick, trimmed with stone and finished inside with Georgia pine. The floors of the corridors and dining rooms are of tile; the other floors of hard wood, with the main stairways of slate. The cottages are connected with the main building, dining rooms and school by long, covered passage-ways, with the sides almost entirely of glass. Those now finished are the administration building, boys', girls' and industrial school, teacher's residence, gymnasium, boys' and girls' dining halls, kitchen and bakery, cold storage, power house, laundry, workshop, etc., and sixteen cottages.

The cottages, like the other buildings, are two stories high, the lower rooms used by the inmates for studying and the upper as dormitories, where each child has his own comfortable, spotlessly clean bed. The eight cottages to the right of the administration building are assigned to the boys, and those to the left to the girls, and there is no direct communication between the two departments.

The industrial school department consists at present of a sewing room, where the girls are taught plain sewing, and a shoe shop. A tailor shop can soon be added, from which revenue will come. A large room has been fitted up as a manual training school where the Sloyd system is taught.

The boys are given military drill exercises, and the fine gymnasium, well equipped with modern appliances, is in daily use. The gymnasium has been named Kerlin Hall, in honor of Dr. Kerlin.

There are two large dining rooms, one for the boys and one for the girls, each with tiled floors, well ventilated and well lighted, a frieze of colored glass over the long windows adding to the cheerful and attractive appearance. The kitchen and laundry are admirably planned. In both these departments the pupils are employed as assistants. The abundance of light and excellent ventilation are special features of these buildings. The inmates now number about 350, 150 having been brought from Elwyn in April. Dr. J. Moorhead Murdoch is superintendent, and Dr. Henry McDowell, assistant physician.

VIRGINIA.—*Western State Hospital, Staunton.*—Among the improvements last year was an ice and cold storage plant, manufactured in Cincinnati. This plant consists of one ammonia-gas compressing pump, the cylinder of which is six inches in diameter, with a twelve-inch stroke, connected

directly with one thirty horse-power steam engine, all on one base. The compressor makes from eighty to a hundred revolutions per minute, and has 2000 pounds ice-making and 8000 pounds refrigerating capacity, besides cooling six rooms, the dimensions of which in all are 6800 cubic feet. One of these rooms is piped for butter, to maintain a temperature of from 32 to 35 degrees, or lower if necessary; another for vegetables, kept at from 45 to 50 degrees; and another for general purposes, which may be kept at any temperature desired. One room is for chilling meats and two for storing them for any length of time required, for six months or longer. In addition to the compartments already mentioned, there is a vestibule four feet wide, ten feet high, and twenty-eight feet long, in which the animal heat is taken from the meats, after which they are taken to a large chilling room and cooled to the proper temperature, when they are taken into the storage room mentioned above. Here they are kept at a temperature of from thirty-two to forty degrees, and are taken out for use at such times as they may be needed.

The plant also makes 2000 pounds of ice a day, using the brine system. The brine tank is sixteen feet long, seven feet wide, and four feet high, and contains about forty freezing moulds of 100 pounds each. The capacity is 100 pounds of ice every hour. The same brine which converts the water into ice is used for the cooling room referred to above. A large brine pump distributes the brine through one and a quarter inch pipes, so arranged that the rooms can be cooled all together or separately, and to different temperatures. The six rooms will hold from fifteen to twenty beeves, besides fruit, butter, eggs and such other perishable articles as are used by the hospital. They are arranged with overhead railway tracks, furnished with rollers and meat hooks, and with switches by means of which the meats can be easily carried from one room to another. They are perfectly ventilated with traps in the ceiling, by which the animal heat and any foul air that may accumulate may escape.

The machinery is run at a very low expense, not using more than seven or eight gallons of water per minute. The steam used is from the general boilers. The expense of the chemicals will not exceed \$10 or \$15 a year. As the machine is almost automatic, it requires attention only two hours a day.

The plant is considered an economical investment. Heretofore beef has been delivered in lots of from ten to fifteen head, and as only one could be killed a day, the expense of feeding before slaughtering was considerable. And besides the disadvantage of being obliged to use the beef before the animal heat was well out of it, experience has shown that from drift and other causes there was a loss of an average of one hundred pounds per head between the time of purchasing and that of using the meats. There will also be a saving by purchasing and storing butter, eggs, etc., at such seasons as they are abundant and cheap.

WISCONSIN.—The SUMMARY is indebted to Dr. Becker, of Milwaukee, for papers on the insanity law of that State. The difficulties and misun-

understandings arising from commitments under the old law, characterized as a "lawyer's law," has been in great measure overcome by Chapter 319 of the Laws of 1897, passed in April. The results attained by the new statute now in operation are stated by Dr. Becker to be as follows:

"Since doctors must hold the commitment of the insane essentially a medical matter and only by sufferance a judicial one, and since this law has been a compromise between the medical and legal bearings of the subject, it is not only our right but our duty to construe it in a way most favorable to the interests of the patient. This would be to bring as little judicial or official proceeding into the case as possible, and though it is necessarily somewhat involved in its phraseology, to keep it simple in its operation. Thus it would seem that the proceeding ought to be as follows:

"Three respectable citizens make application to the county judge.

"The judge thereupon appoints the two physicians.

"Such physicians, after being registered as qualified, proceed either singly or jointly to examine the patient. For reasons that *notice* would be 'injurious' or of 'no advantage to him by reason of his mental condition,' they do not give him *notice* and state their reasons as here quoted or at greater length in their report. Or if they feel bound to give the notice in certain cases (in which it would seem they are inconsistent if they have no doubt of the insanity or the propriety of commitment), they should explain to the patient that it is a formality and dissuade him from making a defense.¹

"The patient in the meantime to be in temporary detention quarters when and wherever such are established.

"The judge in nearly all cases to accept the opinion of the physicians as to notice and their report as to insanity, and to issue the commitment without further proceeding if the patient is found insane.

"The patient then, whenever possible, to be conveyed to the hospital by a friend.

"The most important features of the new law have thus been alluded to. For others the reader is referred to the text of the law. It should be mentioned that this law does not repeal the entire old law, but only such parts as are in conflict with it.

"In closing, it may be asked what has been accomplished by the passage of this law—what has been gained or lost by the compromise.

"To this it may be answered: Removal of the legal and practical chaos that has prevailed in the commitment of the insane in Milwaukee.

"Preventing passage of a 'lawyer's law' making notice necessary in every case, or establishing compulsory jury trial, or providing guardian *ad litem* in every case.

¹At the time of going to print [May, 1897] there have been—during the few days that the law has been in operation in Milwaukee—nine commitments. In seven of these no *notice* was given the patient by physicians nor judge. In two, *notice* was given by physicians, but no hearing was desired by patient. There have also been two voluntary commitments in addition.

"The leaving of large discretion to the commitment magistrate.

"A law which in its practical application need not be so strenuous as to injure the medical requirements of the insane, yet is strenuous enough to stand muster in the courts and allay all future suspicion of possible fraudulent or improper commitment."

QUEBEC.—*Protestant Hospital for the Insane, Montreal.*—The Annex, a separate building with a capacity of one hundred beds, for the reception of chronic, violent and uncleanly patients, was opened during the summer. It has proved a great boon, admitting, as it does, of a much better classification of the inmates in the hospital proper.

The new infirmary is almost ready for occupation. This is a detached stone building of ornamental design, having a capacity of twelve beds, with diet kitchen, operating room and post-mortem room attached. When opened it will be in charge of a trained hospital nurse, being specially intended for medical and surgical cases which could not receive all the advantages of modern treatment in the general wards of the hospital. Wide balconies, with a southern exposure, are provided for the benefit of convalescing patients.

The erection of a new flight of granite steps, sixteen feet wide, protected by a handsome porte-cochère at the main entrance of the hospital, has added greatly to the appearance of the building. A new horse stable, to replace that destroyed by fire on Christmas morning last, has been built at a cost of \$5000. The original electric plant being now inadequate to the wants of the institution, a new one with duplicate dynamos, storage batteries, etc., is to be installed.

A noteworthy event during the past half-year was the meeting of the British Medical Association in Montreal. The members of the Psychological Section were driven out to the hospital and, after partaking of refreshments, were conducted over the entire institution, with which they expressed themselves as much pleased.

Appointments, Resignations, Etc.

- ALLEN, DR. GEORGE, formerly First Assistant Physician at the Middletown State Homeopathic Hospital, appointed Superintendent of the Collins State Homeopathic Hospital, Collins, N. Y.
- ARTHUR, DR. DANIEL H., promoted to be Second Assistant Physician at the Middletown State Homeopathic Hospital, Middletown, N. Y.
- BELL, DR. SAMUEL, appointed Medical Superintendent of the Upper Peninsula Hospital for the Insane, Newberry, Mich.
- BOLTON, DR. JAMES R., appointed Third Assistant Physician at the Essex County Hospital for the Insane, Newark, N. J.
- CORT, DR. PAUL L., appointed Fourth Assistant Physician at the New Jersey State Hospital at Trenton.
- FELTY, DR. JOHN C., promoted to be Senior Assistant Physician at the New Jersey State Hospital at Trenton.
- FRANCISCO, DR. DAVID E., promoted to be Junior Assistant Physician at the Middletown State Homeopathic Hospital, Middletown, N. Y.
- FURLONG, DR. FRANCIS M., appointed Junior Assistant Physician at the Matteawan State Hospital, Fishkill, N. Y.
- GIVENS, DR. JOHN W., reappointed Medical Superintendent of the Idaho Insane Asylum, Blackfoot, Idaho.
- HOMER, DR. J. RICHY, appointed Junior Assistant Physician at the Middletown State Homeopathic Hospital, Middletown, N. Y., May 1, 1897; resigned October 1, 1897, to accept a professorship in the Cleveland Homeopathic Medical College, Cleveland, Ohio.
- INCH, DR. GEORGE F., promoted to the Medical Staff of the Michigan Asylum for the Insane, Kalamazoo, Mich.
- KINNEY, DR. C. SPENCER, promoted to be First Assistant Physician at the Middletown State Homeopathic Hospital, Middletown, N. Y.
- MASON, DR. G. C., appointed to the Superintendency of the Southern Hospital for the Insane, Evansville, Ind.
- MCCALMONT, DR. HARRIET O., formerly of the State Hospital at Warren, Pa., appointed to the Medical Staff of the Michigan Asylum for the Insane, Kalamazoo, Mich.
- POTTER, DR. CLARENCE A., appointed Medical Interns at the Middletown State Homeopathic Hospital, Middletown, N. Y.
- POWELSON, DR. ARTHUR PALEN, promoted to be Junior Assistant Physician at the Middletown State Homeopathic Hospital, Middletown, N. Y.
- ROBERTSON, DR. E. H., formerly of the Michigan Asylum for the Insane, appointed to the Chair of Pathology in the University of Colorado.
- SESSIONS, DR. SARAH K., appointed Assistant Physician at the Southern Hospital for the Insane, Evansville, Ind.
- SHAW, DR. HARRY L. K., appointed Junior Assistant Physician at the Utica State Hospital, Utica, N. Y.
- TESTER, DR. J. NELSON, resigned as Assistant Physician at the Utica State Hospital, Utica, N. Y.
- TRUSSLER, DR. LESLIE L., appointed Assistant Physician at the Southern Hospital for the Insane, Evansville, Ind.
- WORKS, DR. H. M., appointed Second Assistant Physician and Pathologist at the New Jersey State Hospital at Trenton.
- WILLIAMS, DR. E. H., Assistant Physician, transferred from the Matteawan State Hospital, Fishkill, N. Y., to the Manhattan State Hospital, New York City.

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PRESENT METHODS OF PREPARATION OF THE NERVOUS SYSTEM.

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The nervous system, including as it does a variety of component tissues, epiblastic and mesoblastic in nature, requires a considerable number of methods of treatment for the accurate microscopic presentation of the elements, nerve cell and fibre, neuroglia, blood-vessel, and, in its peripheral portions, the component sheaths and fibrillæ entering into the formation of the nerve bundles of the neuro-muscular terminations.

While great advances have been made in the last decennary in methods of staining for accurate examination into the intimate structure of nerve tissue, histological methods have far surpassed those of pathological research, and to-day the discovery of a ready means of bringing into view the nerve cell in its entirety, permitting at the same time a view of its finest structures, is much needed, and is the aim of every neuro-pathologist.

The methods of preparation detailed in the following pages have been all used, either by the writer or by others in the anatomical and pathological laboratories of the Johns Hopkins University.

METHODS FOR THE PRESERVATION OF THE ENTIRE BRAIN.

Before beginning the larger section of this article, a few lines on the preservation of the entire brain and cord may not be inappro-

priate, as it is often desirable to keep a cerebrum, for demonstration or for legal purposes, and at the same time so preserve it that, if necessary, stained sections may be had at some future time.

Formol.—By far the best agent we have for this purpose is the solution of formaldehyde (HCOH) commercially known under the name of *Formol*. As a method of tissue preservation it was introduced by the elder Blum more than four years ago, and has successfully stood the test of time. Ten per cent. solutions are most frequently used (it should be remembered that the formol solution contains only about 40 per cent. of the gas, hence a 10 per cent. solution contains actually less than five per cent. of formaldehyde).

A brain laid in this fluid, and changed once or twice, when the quantity of surrounding solution is not large, will, at the end of several months, still preserve its natural colors, and even the blood contained in the smaller vessels will have the red tints of hemoglobin. Solutions of less strength may be used, and even 1 per cent. will preserve tissues, but the results are not so good as with the stronger mixture.

The great benefit derived from using formol solutions is that they penetrate evenly and very rapidly, so that the central portions of a hemisphere are equally as well hardened as the periphery, and accordingly, provided the solutions are of the proper strength, there is no danger of an over-hardened cortex and a decomposed medullary mass. It has, too, the advantage that the process of after-hardening, for the aims of microscopic work, may be completed in Müller's fluid, in alcohol, or in any of the various chromic acid salts now in vogue. The disadvantage of the formol solution lies in the fact that it causes considerable swelling of the brain substance from absorption of water, and consequent distortion. This is much more true for the weaker than for the stronger solutions. In a 1 per cent. solution a brain, according to Flatau, will gain 14 per cent. of its weight in two days, and at the end of a month 23 per cent.; while in a 10 per cent. solution at the end of the month it will gain only two or three per cent. Admixtures of formol and ethyl alcohol have been suggested to counteract this swelling, the proportion of equal parts of a 10 per cent. solution formol and 60 per cent. alcohol solution seeming most appropriate. Combinations with

acetate of potash and other salts have been advised, but, from the experience of the writer, these have seemed to be without benefit. Brains hardened in formol have the great advantage that within three or four days they are sufficiently firm to permit handling.

If at any time a brain so hardened should be needed for class or demonstration specimens, after a short immersion in 96 per cent. alcohol, a coating of thin celloidin may be applied to it with a camel's hair brush, and dried in the air. If this cerebrum is then reimmersed in formol-alcohol solution it can lie exposed to the atmosphere for hours without injury.

Ordinary Ethyl Alcohol, while useful when formol is not to be had, has many disadvantages. Unless great care is taken to change the specimens frequently, the tissues shrink unevenly and the preparation has an unsightly appearance. Besides, the alcohol does not penetrate so rapidly as the formol, and the danger that interior spots may soften is greater. The best mode of employing it is to place the entire brain, usually stripped of the meninges, in a sufficient quantity of a 60 per cent. solution, to change it after a few hours to an 80 per cent., and after several days to an 85 per cent. solution.

Müller's Fluid, except for its cheapness, cannot be recommended for the preservation of brains in toto, if it is desired to keep them for any length of time. The pia mater should be carefully stripped off and the brain immersed in a large quantity of the fluid. This should be changed at the end of six hours, and then daily for a week, or until the fluid remains perfectly clear, and thereafter at the end of each month. Unless the hardening process is made at a temperature above 70° F. there is great liability that only the outer shell of the hemispheres will harden properly, while the interior white substance will become softened and ready to break down on handling. Müller's fluid hardening is to be recommended when it is necessary to keep a brain for a few weeks for legal or demonstration purposes and afterward immediately to make a microscopic examination by the Weigert or Pal method.

The *Zinc Method of Giacomini* gives fairly good permanent preparations. The fresh brain is laid for eight or ten hours in a ten per cent. solution of zinc chloride and turned frequently.

At the end of this period the pia is removed. It is now replaced in the fluid and allowed to remain several days, or until it has shrunk considerably. It is changed then to 80 or 90 per cent. spirit, and afterwards changed every two or three days, and, when well hardened, laid in glycerine to which 1 per cent. of pure carbolic acid is added. After the glycerine has completely penetrated the tissues the preparation is placed on an inclined glass plate and the superfluous glycerine allowed to run off. Preparations made in this manner may be exposed to the air for years without injury. It is recommended to inject the carotid arteries with the zinc solution in event the brain is not very fresh.

Plastic Reproduction.—A somewhat troublesome but very satisfactory method of preserving uncommon brain specimens is by *Plastic Reproduction*. The brain is hardened in strong formol, or even better, in formol and alcohol, until quite firm, and dehydrated for a day in 96 per cent. alcohol. A paper box of sufficient size to hold the entire brain conveniently is then procured, into which the brain is placed and well supported. A mixture of equal parts of bees-wax and rosin is melted together, thoroughly stirred, and poured into the box, just sufficient to cover one-half of the brain. This is allowed to thoroughly cool. Then the upper surface of the wax is sprinkled with powdered soapstone or thoroughly anointed with oil, and sufficient melted wax and rosin poured into the box to more than cover the brain. After again cooling, the halves are separated, the brain removed, a small aperture bored into the shell, and calcined plaster of Paris, mixed with sufficient water to flow easily, is poured into the mould. The model when removed is an exact reproduction of the brain, and may be painted with oil color to resemble the original preparation. The use of plaster of Paris instead of ordinary wax to form the model has many advantages over the method introduced by Berliner, as the wax does not take colors easily and is liable to become soft at summer temperatures.

SECTION OF THE BRAIN WITH A VIEW TO AFTER-MICROSCOPIC EXAMINATION.

Of the several methods of sectioning the hemispheres, the method of Virchow, and the modification of the same commended by Weigert, are entirely unsuited for the purposes of after-micro-

scopic examination. The single method that is at all adapted to the purpose is a modification of the method of Pitres. Not only does this method permit an exact localization of any focal disease, but it ensures complete penetration of the fixing agents into the cerebral substance.

The first essential is a broad double-edge knife, such as is made by Walb of Heidelberg, for the purpose.

The Pitres method calls for the first cut through the hemispheres to be made 5 cm. in front of the central fissure; the second at the level of the calcarine fissure. This divides the hemispheres into three unequal portions, the middle or fronto-parietal being the largest. This portion is now subdivided by four further cuts, the first through the rear portion of the frontal convolutions, the second through the anterior central convolution, the third through the postero-central convolution, and the last through the posterior portion of the temporal convolutions.

For both macroscopic and microscopic ends it is all-sufficient to divide the hemispheres with clean sweeps of the knife from the anterior to the posterior poles at intervals of 2.5 cm. The brain should be placed on a thick towel and divided with single strokes, the hemispheres being held together by the pressure of the hand. The gray matter, centrum ovale, corpus callosum, ventricles, internal capsule, and ganglia, are successively presented to view, and in such a manner as to enable one to detect the slightest departure from the normal. Afterwards the several sections are placed in a vessel upon cotton, and sufficient preservative fluid poured upon them, and this should be frequently changed. Each section represents a definite portion of the hemispheres, and its location in the brain can be accurately determined at any time. If large macroscopic sections are desired, the procedure of Bramwell will be found most convenient. (Brain, Vol. X.)

HARDENING MEDIA FOR MICROSCOPIC WORK.

In selecting the various methods of hardening for microscopic work one must predetermine what agents are to be employed for the staining processes. *Alcohol*, for instance, is not well adapted to many formulas besides that of Nissl, and for some nuclear stains. *Chrome Salts*, while more generally applicable

for a considerable number of stains, are not suitable to others, and accordingly it is better to place our pathological material in several rather than in one agent, to insure a sufficient supply in case of failure of one reagent to properly stain. Half decomposed material should never be used for microscopic purposes, it is never satisfactory and often leads to false conclusions.

Bichromate of Potassium.—This chemical alone, or in combination with other salts, is more applicable to general nerve microscopic work than any other single salt one has at command. Bichromates of ammonium, lithium and other metals are occasionally recommended, but possess no advantage over the less expensive potassium salt.

The best combination of the potassium bichromates with other salts is the well-known and universally used *Müller's Fluid* in the following formula:

Kalium bichromat	2 parts.
Sodium sulphate	1 part.
Dist. water	100 parts.

The most essential thing to remember in using Müller's fluid is to always use a relatively large quantity of fluid to the size of the specimen, to renew frequently, and to turn the specimens daily if they are at all large. If the portions of the brain are small they may be suspended in the liquid, or if larger, laid upon cotton. To insure proper penetration they should never be more than 2 cm. in thickness, and the thinner they are the better. Usually it takes from three to four weeks to harden specimens in this fluid to a proper consistency for section cutting, but in a warm chamber, at blood-heat, the same end may be accomplished within ten days, but it requires more frequent changes of the fluid. To prevent the formation of mould in Müller's fluid a small piece of thymol or camphor may be added to each jar. If the chemicals used are pure, and dissolved in recently distilled water, there is little danger of mould-formation.

The *Erlicki Fluid*, with sulphate of copper replacing the corresponding salt of soda, is not to be recommended, on account of the deposit of copper salt in the tissues and the great difficulty in removing the same.

Formol has within the past few years become one of the most

important means of hardening pathological preparations of the nervous system. For finer work it is not equal in many respects to alcohol or the chrome salts, but for ordinary pathological examinations it answers every purpose. It may be used either alone or in combination with alcohol to avoid over-swelling, or with Müller's fluid (equal portions of a ten per cent. solution and Müller's fluid) for stains that do not admit of use with alcohol. Five to ten per cent. solutions are ordinarily in use; too much of the formaldehyde does not answer, too weak solutions distend the tissue too greatly. After-hardening of formol preparations may be made equally well in alcohol or in Müller's fluid, but in the latter case it is advisable to have the sections of tissue thin, and to allow them to remain in the chrome salt solution for at least one month.

All dyes that tinge alcohol preparations will act equally well with formol. Thoroughly dehydrate the preparations before cutting into microscopic sections, and moisten the knife with 95 per cent. alcohol. Formaldehyde answers perfectly well for the important Nissl methods, for the Weigert myelin stain, after immersion for weeks in Müller's fluid, and also, after this treatment, for the Marchi method, for thionin, and even for the complicated neuroglia staining of Weigert, after appropriate treatment according to his formula. It may replace osmic acid for the Golgi-Cajal stain, though the impregnation of the nerve cells has always seemed to the writer of a coarser type than when osmic acid has been used. *Marina's* method of hardening (*Neurol. Centralblatt*, No. 4, '97), has the advantage that the tissues set quickly, and may be used either for the Weigert hematoxylin or Nissl method. The receipt is:

Alcohol 90 per cent.....	100 cc.
Formol 40 per cent.....	5 cc.
Chromic acid	10 cgrm.

The last reagent is to be added while stirring constantly, and the whole is allowed to stand some hours before it is used. Change the fluid on the second day, and thereafter every five days. The pieces of tissue are now stuck to a cork and immersed in 95 per cent. alcohol for several hours. Sections are made under strong alcohol. For the Nissl method they are immersed

in methylin blue solution for twenty-four hours, and treated afterwards according to that formula. Thionin may be substituted for methylin blue with equal results. For the Weigert coloring the sections come from the 96 per cent. alcohol into Vassale's modified copper solution (see Special Methods of Staining), in which they remain for twelve hours, are then thoroughly washed, and are placed in the lithia-hematoxylin solution in the warm chamber for twenty-four hours. Decolorize according to the usual method, to be later referred to under section "Special Methods of Staining."

Ethyl Alcohol is in frequent service in hardening portions of the nervous system. Alone it is not well adapted to the peripheral nerves, but is much used to harden portions of the brain and cord in special methods of staining. The object is placed first in 70 per cent. alcohol solution, then after one or more days it goes into 80 per cent., then 90 per cent., where it may remain until needed. For nuclear stains, the Nissl method, thionin, hematoxylin, and carmine, especially staining in bulk; very handsome and instructive preparations may be obtained from alcohol alone.

Bichloride of Mercury solutions are seldom used for pathological work.

METHODS OF FIXATION.

The difference between hardening and fixing is one of rapidity only, but this is in itself very important. In hardening we hope to secure an equal penetration of the fluid into the tissues, slowly or with moderate rapidity, but in fixation the aim is to set the tissue with the utmost rapidity, to insure the preservation of the cell contents in a condition as close as possible to what they were at the moment of death. Thus fixation is used for the demonstration of nuclear figures, in preparations to show the granulated and striated contents of the cell protoplasm, or for the dust-like grains located in the karyoplasm of the nucleus. Naturally we are not often able to obtain preparations from the human subject in the same fresh state that we can from one of the lower animals, though even in the first instance fixation is useful to determine certain conditions of cellular structure.

Osmic Acid, in from 0.5 to 2 per cent. solutions, is in frequent use with the peripheral nervous apparatus, both for fixation and

hardening. The duration of the exposure of the nerve teased, or in section, should be as short as is consistent with proper staining, and the quantity of the fluid used should not be too small. Nerve bundles may be allowed to remain over night in weak solutions. Osmic acid is more frequently used in combinations with other tissue-hardening chemicals than alone. One of the best of these is the mixture known under the name of *Flemming's Solution*:

Chromic acid sol. 1 per cent. 15 parts.
 Osmic acid sol. 2 per cent. 4 parts.
 Acetic acid glacial. 0.5 to 1 part.

The objects to be hardened should be very thin, not more than 2 mm., and should remain in the fluid from 12 to 24 hours. They are then washed slightly in water, then go into 70 per cent. alcohol, changed and increased to 96 per cent. Sections should be made within a few days. The method is applicable to hematoxylin, safranin, carbofic fuchsin, methyl violet, and some other of the anilines.

The modification of the chrome-osmium-acetic acid mixture, known by the name of *Fol's Modification*, has some advantages over the above method in that the penetration into the cerebral tissue is deeper, and equal care in removing the specimen from the fluid is not so necessary. It is composed of:

Superosmic acid solution 1 per cent. . . . 2 parts.
 Chromic acid solution 1 per cent. 25 "
 Acetic acid solution 2 per cent. 8 "
 Dist. water 68 "

Preparations are hardened in from 24 to 36 hours, and are then treated as above. If the solution becomes cloudy during the fixation it should be changed. The change to alcohol is either direct or after previous washing.

Absolute Alcohol is a most convenient means of fixation. The tissues are quickly and evenly penetrated by the fluid, and the tissues so fixed answer for a variety of staining processes. Alcohol is essential to the Nissl magenta and methylin blue processes, and for many nuclear stains. A good consistence for the finest sections is obtained within two or three days, and the

cutting should not be delayed, if the best results are wanted, as the alcohol soon removes a portion of the fatty substances from nerve tissue. The objects to be fixed should be suspended, or the bottle should be half filled with cotton and the specimen laid upon it. Absolute alcohol being of less specific gravity than that containing water, the result is that when the water is absorbed from the tissue the heavier alcohol sinks to the bottom, and the nearer to the surface the block of tissue is placed the sooner will it become dehydrated.

EXAMINATION OF FRESH TISSUES.

It is comparatively seldom that it is necessary to examine fresh portions of the central nervous system for pathological aims. Occasionally a tumor or softening of the cerebral substance may be found at an autopsy where it is desirable to make an immediate and rapid examination. Then frozen sections are the most desirable method of treatment, the sections to be afterwards treated with formol in dilute solution, and stained with hematoxylin and eosin (Cullen). In certain cases where it is desirable to ascertain the condition of the neuroglia, a cold 1 per cent. solution of nigrosin or aniline blue-black may be used. Teased preparations of the brain or cord are not very advantageous. The tissue should be macerated for some hours in 30 per cent. ethyl alcohol, or in very dilute methyl alcohol and glycerine (Schiefferdecker), or in diluted formic acid. They may also be placed in alum or borax carmine, methyl blue, or even picrocarmine, for several hours to a day, and then torn to pieces with needles, or, when very small, flattened under a cover-glass. This last method permits of a better view of the fine blood-vessels than could be otherwise obtained. The addition to alcohol of a few drops of 1 per cent. chromic acid solution helps to render staining less diffuse. Peripheral nerves may be macerated in dilute solutions of osmic acid for 24 hours in the dark to detect changes in the myelin sheath, but some of the fixation methods with chromic acid, and cutting the bundles into fine sections with differential staining, present many advantages.

METHODS OF IMBEDDING FOR SECTION CUTTING.

After the specimens have passed through any of the above methods of hardening or fixation, and have been thoroughly

deprived of the inherent water, it is necessary to imbed them in some material, non-resistant to the knife, which will at the time serve the double purpose of holding the tissue to pieces of wood or cork and give them some support when meeting the edge of the knife. Another object in imbedding must sometimes be kept in view, the saturation of a very soft or friable object with a material that will harden in alcohol and form a coherent mass and yet may be removed when necessary without injury to the section. For these purposes the ordinary *Celloidin*, dissolved in equal parts of alcohol and sulphuric ether to form a thin syrupy fluid, seems best adapted. Customarily, with preparations of the cortex or pons, the celloidin hardly penetrates at all into the tissues, and it is only necessary after placing the thoroughly dehydrated object in a celloidin solution for from a few minutes to an hour, to set it on a cork and allow the celloidin to dry in the air until fairly firm and then place it in 80 per cent. alcohol for an hour or two. Cooling the jar containing the diluted alcohol and blocks of tissue, under a stream of water, makes the celloidin harden much more rapidly than at the room temperature and saves much valuable time. When the preparations are very friable it is better to have two jars of celloidin on hand, one very thin, the other of greater consistency. After the specimen has been several days in absolute alcohol it is placed in the thinner fluid for one day, or even two or three days, then in the thicker, and afterwards it is placed on a cork and cut. The whole process has the following stages:

1. Dehydration of the tissue in absolute alcohol.
2. Placing in thin and thick celloidin.
3. Sticking on a cork and immersing in 80 per cent. alcohol.
4. Cutting the sections under 90 or 95 per cent. alcohol.
5. Staining.
6. Washing thoroughly in water or alcohol.
7. Dehydration.
8. Clarification in ethereal oil and zylol.
9. Imbedding the section in balsam under a cover-glass.

Celloidin has marked advantages over the gum arabic sometimes used to fix the object to the cork, and may be used in the same way, always allowing it sufficient time to dry in the atmosphere before immersion in the diluted alcohol.

Except for some special methods and for serial sections, the *Paraffin Method* has no advantage over celloidin, and the continued heat used in the process is a serious disadvantage to delicate tissues. The portion of the nerve substance to be imbedded, after having been thoroughly dehydrated in alcohol, is placed in zylol or turpentine containing paraffin, where it remains until permeated by the fluid. It is then placed in molten paraffin for from two to twenty-four hours, until penetrated, but the shorter the time it remains exposed to heat the better. This paraffin should not have a melting point above 108° to 110° F. After the penetration is completed the block of tissue is set in a mould or in a paper box, the melted wax poured around it and allowed to cool. The block may afterwards be reduced to a convenient size by cutting away the superfluous paraffin with a heated knife. Sections which are to be cut without moistening the knife have, in case they are already stained, the paraffin removed by zylol, cleared in carbol-zylol, and mounted in damar or Canada balsam; or when the sections are still to be stained, they are brought from the zylol into alcohol, and from this into the selected staining medium.

The *Freezing Method* of section-cutting possesses no advantages over celloidin, and is not often used, except as before mentioned, for the examination of fresh tissues. Either alcohol or chrome preparations may be used, but the former should be thoroughly soaked in water before the freezing process is begun.

CLEARING IN ETHEREAL OIL AND IMBEDDING IN BALSAMS.

After the sections of tissue have been dehydrated in absolute alcohol it is necessary for the proper definition under the microscope to clarify them in ethereal oil of some kind. Bergamot is the best for every-day use; organum and cajeput oils are efficient substitutes. None of these oils dissolve celloidin nor act to any extent upon the aniline colors. Oil of cloves dissolves celloidin and acts more energetically upon coloring matters. Zylol is often useful, and is required by some formulæ. Creosote and carbolic acid are inefficient substitutes for the oils.

Canada Balsam in zylol answers every purpose of ordinary imbedding. *Damar Lack* remains clearer than the balsam.

Imbedding in glycerine, or glycerine containing a trace of

formic or acetic acid, answers for fresh specimens, or *Farrant's Solution* (pure gum arabic dissolved in glycerine and concentrated solution arsenious acid) may be successfully substituted. Carmine and hematoxylin preparations preserve their colors perfectly in this medium.

METHODS OF STAINING.

We now reach one of the most important parts of microscopic technique—the staining of the hardened tissues. While it is true that unstained sections at times may give sufficient definition between the component elements to enable one to determine the outlines between them, and to a certain extent the cellular contents, yet such a procedure is usually insufficient to enable one to clearly see the finer alterations of the nucleus or protoplasm in pathological conditions, and one is obliged to use selective stains for this purpose. Stains are either diffuse or selective, and in accordance it is often desirable to choose a combination of the two, the well-known eosin-hematoxylin stain offering the best example of a selective and diffuse stain, the eosin coloring all the different tissues, the hematoxylin selecting the nuclei.

SIMPLE STAINS.

Hematoxylin is probably the most valuable of all staining agents to the neuro-pathologist, and, as it is selective, it is ordinarily used in combination with one or other of the diffuse stains, carmine or eosin, and in fact there is no stain so applicable for general purposes as this latter combination. Hematoxylin preparations should never be mounted in glycerine if it is desired to preserve them for any considerable length of time.

Delafield's Hematoxylin is one of the very best of these stains in general use for preparations of the nervous system. It has the great advantage that it may be made to stain slowly or quickly, as desired, according to the degree in which it is diluted. As a rule several hours should be allowed to elapse before the preparations are removed from the solution, to obtain perfect nuclear staining.

To prepare it, one gram of crystallized hematoxylin is dissolved in 5 cc. absolute alcohol and allowed to stand in the dark for

several days. This is added to 100 cc. saturated solution of ammonia alum, stirring constantly. After standing three or four days in an open flask the fluid is filtered, and to it are added 50 cc. each of methyl alcohol and pure glycerine. Filter again after standing a day and seal for future use. It is customary to allow the resultant liquid to stand in the dark for several months before using it for staining purposes.

For over-night staining it should be diluted with water until it is a light violet, and the sections, thoroughly washed in water, are placed in it. Quicker tingeing—one half hour—may be had by immersion in much less diluted solutions, but the beautiful blue-violet nuclear staining is not so sharp as by the longer method.

Boehmer's Hematoxylin is a much quicker staining preparation than the foregoing one. Separate solutions of a 10 per cent. hematoxylin crystals in absolute alcohol and a 1 per cent. solution of potash alum are to be prepared some days before they are needed. Sufficient of the hematoxylin is added to the alum solution to produce a fairly deep violet, and the flask is left exposed to the light for some days, during which time the color will darken considerably. It is now ready for use. If over-staining takes place the solution should be diluted. The procedure for section staining with this hematoxylin is:

1. Thorough washing of the sections in water.
2. Staining from two to four minutes.
3. Thorough washing in distilled water for several hours.
4. Gradual dehydration in alcohol.
5. Clarification in bergamot, origanum oil or clove oil to remove celloidin.
6. Mounting in Canada balsam.

Sections coming from *Boehmer's hematoxylin* into water darken considerably, and on that account should not remain in the fluid over-long. Over-staining may be remedied to a certain degree by washing in weak alum solution and then in water. Exposure to acids should be avoided. The nuclei are stained a deep blue, the protoplasmic substance is slightly or not at all tinged.

Ehrlich's Acid Hematoxylin is often useful when the tissues

have been long in Müller's fluid or the chrome salts. Two grams of hematoxylin are dissolved in 100 cc. absolute alcohol, and to this are added 100 cc. of each distilled water and glycerine, and the mixture is shaken frequently. To this mixture 6 cc. glacial acetic acid are slowly added, and afterwards an excess of alum. At the end of a few hours the resulting liquid is filtered, and then exposed in a flask to the light for three weeks. The further procedure is the same as by the last receipt. Nuclei are tinged deep blue, the protoplasm a light blue.

Carmine Solutions are much less used than formerly in staining the nervous system. For sections of the spinal cord, giant cells of Betz, or for the peripheral nerve bundles, to tinge the axis cylinder, it is very serviceable, and the resulting preparations are far more durable than those prepared with the aniline dyes.

The writer has found the *Borax Carmine of Grenacher* the best for these purposes, but to insure success a very fine quality of carmine must be used. Two hundred cc. of a 1 per cent. solution of sodium baborate are thoroughly boiled with one-half to two grams of carmine, and to the cooling fluid diluted glacial acetic acid is added until it assumes a dark red color. After cooling a portion of the carmine will be precipitated, and upon standing over night the supernatant fluid should be decanted, when it is ready for use. After long standing more carmine will be precipitated, but the solution retains its fine staining qualities until it is of a straw color, and especially is this true for the axis cylinder. For sections out of absolute alcohol, the duration of the immersion in the staining fluid should not be more than fifteen to thirty minutes; for the chrome salts hardened tissues the sections may remain over night. After removal from the carmine fluid wash in 1 per cent. hydrochloric acid alcohol, dehydrate, clarify in bergamot or clove oil, and mount in balsam, or glycerine and Farrant's solution may be used.

Over or diffuse staining may be remedied by keeping the sections for some time in the acid alcohol. The nuclei should be stained a brilliant red, the protoplasm less deeply, the neuroglia nuclei are well defined, and the axon should be light red.

Borax carmine may also be used for staining in toto the tissues coming directly from Müller's fluid after careful washing for several days. The penetration is slow, and an occasional cut may be made to observe the progress of the staining.

Ranvier's Picro-Carmine is more applicable to the staining of the cerebral vessels than to the nerve cells. The protoplasm is stained yellow, the nuclei a brown-red. Hyaline degeneration of the sheaths of the vessels is easily detected. The formula is:

Carmine	1.0 gram.
Liq. caustic ammon.	3.0 "
Aqua destil.	10.0 "

The carmine is to be dissolved with the aid of heat, and 200 cc. of a saturated solution of picric acid is added slowly, and the whole boiled until it loses one-third of its volume. Sections out of this solution are to be washed in glycerine containing 1 per cent. hydrochloric acid, to which a little picric acid is added. Also the water used for the final washing is acidulated with picric acid, and finally the alcohol used in dehydration should contain a small amount of the same acid. Clarify in oil and mount in balsam.

Sodium Carminate staining in mass, especially for the pyramidal and Purkinje cells, affords some beautiful preparations, though the process does not allow one to study successfully the finer structures of the cells. The objects to be stained, either out of alcohol or Müller, go directly into a 1 per cent. solution, where they remain usually for a week to ten days, and are then dehydrated and cut.

The Aniline Colors can be used as a rule after formol, alcohol, and chrome hardening. In the latter case the bits of tissue are dehydrated in alcohol before cutting, and after staining are dehydrated, pass through bergamot oil, and then into balsam. Better results are usually obtained by heating the staining fluid after the sections have been placed in it to a temperature of about 150° F. than if they are allowed to absorb the dye in the cold.

Nigrosine is in use, particularly after the method of Bevan Lewis, to stain frozen sections of the brain. Solutions of from 0.25 to 0.50 are used, the duration of the staining process being from a quarter to a full hour, but over-coloring is to be avoided, as it is impossible to remove the surplus. Nerve cell bodies, nuclei, the thicker dendrites, neuroglia nuclei and processes, and the nuclei of the blood-vessels are stained blue-black. The method is not particularly useful.

Safranin and *Magenta* are two of the best aniline colors for investigation of the central nervous system. It is better always to make up a fresh one per cent. solution, place the sections in the fluid, and heat to the steaming point, then pass them directly to 80 per cent., and afterwards place them in absolute alcohol, oil, Canada balsam. Over-staining may be remedied by aniline oil in alcohol, or by hydrochloric acid alcohol, and, indeed, the latter nearly always improves the sharpness of definition. Nuclei and nuclear membranes are stained red; the cell protoplasm is ordinarily untinted in chrome preparations, but shows the Nissl granula in those out of alcohol. These methods are also useful for demonstration of the nuclei of the blood-vessels.

Methyl-Blue and *Methyl-Green*, in watery or alcoholic solutions, are not to be recommended except for the Nissl methylene-blue method.

Carbol-Fuchsin.—One to two per cent. acid fuchsin solution, to which are added a few drops of pure carbolic acid, is particularly adapted to the intimate structure of the nucleus. It also stains the protoplasm of the Purkinje cells to the ramification of the branches. This stain is well suited to Flemming preparations, and the resulting pictures of cellular structure are particularly fine.

Congo-Red is recommended by Nissl as an axis-cylinder and neuroglia stain. The hardening is in bichromate solutions; after hardening in alcohol, stain in a Congo-red solution of 0.75 per cent. strength for seventy hours. Wash the sections in alcohol for five minutes to remove excess of color, then wash in nitric acid alcohol (3 per cent.) for five or six hours; dehydrate and mount.

In *Hematoxylin* and *Eosin* for combined staining we have the most useful double stain for ordinary use, one that serves more purposes than any other, and from which better and more constant results are to be obtained than by any other method; in fact, no examination is complete without it. Stain in Delafield or Ehrlich's hematoxylin and thoroughly wash in water, then immerse for ten or fifteen minutes in a weak watery solution of eosin. Transfer directly to 70 or 80 per cent. alcohol, which will remove any excess of the dye (the sections should not remain for any length of time in alcohol, as it will remove the

eosin entirely), then dehydrate, clear in clove or bergamot oil, and mount in zylol balsam.

SPECIAL METHODS OF STAINING.

The Nissl Method.—The material is hardened in 96 per cent. or absolute alcohol to a good consistency. The pieces of brain tissue are now immersed for a minute in celloidin and stuck to a cork. Cut under 96 per cent. alcohol into the thinnest obtainable sections. Immerse the sections in a methylene-blue solution made as follows:

Methylene-blue pat. B	3.75	grams.
Venetian soap	1.75	"
Dist. water	1000.00	"

Warm the water, dissolve the shaved soap in it, and add the anilin color slowly, stirring all the time. Differentiate in 10 per cent. anilin oil alcohol, made fresh each time it is used, and keep the sections in it until they no longer give off the blue color. Dehydrate, mount the sections on a slide, dry with filter paper, clear on the slide with cajeput oil, again dry, float benzine over the section, and mount in benzine-colophonium. The slide should be slightly warmed in the flame of the Bunsen burner to drive off the excess of benzine. All Nissl methods require the coloring fluid in which the sections are placed to be heated until bubbles of gas appear on the surface of the liquid.

The coloring is beautiful, but not very permanent. Formol preparations stain almost equally as well as alcohol.

Nissl's first method, the *Magenta*, is of very easy application, and gives most beautiful and more durable preparations than the first, but the cell structures are not so clearly defined. The writer has now sections seven years old that have lost nothing of their original brilliancy. The method is:

1. Hardening in absolute or 96 per cent. alcohol.
2. Warming the sections to the steaming point in freshly made one per cent. magenta solution.
3. Washing the stained sections for several minutes in 96 per cent., then in absolute alcohol.
4. Clearing in oil of cloves.
5. Mounting in Canada balsam.

The Nissl coloring furnishes us with a picture of the intimate structure of the nerve cell that is equalled by no other stain. The nucleus and its contents are not so well defined as by safranin and carbol-fuchsin after chrome-osmium fixation, but in the protoplasmic substance of the cell are shown certain irregularly shaped granular bodies arranged concentrically or in rows, that are now known under the name of the granula of Nissl. While it is not entirely certain that these figures are present during life, they are nevertheless perfectly constant in form and disposition in the various types of cell in the brain and spinal cord, and when deviations from these fixed forms are found they are undoubtedly of a pathological nature and warrant a complete investigation.

The methylene blue or magenta accordingly does not stain all portions of the cellular protoplasm equally, but leaves clear (achromatic) spaces between others more deeply stained—the fine-grained chromophilic granula, or particles. As already mentioned, the arrangement of these chromophilic granules is always definite, though varying in disposition according to the character of the cell examined. Thus in the olfactory lobe the arrangement is net-like (arkychromic cells), while those of the cerebral cortex and motor cells of the cord have them mainly arranged in rows (stichochromic cells). Furthermore, the various types of cell are divided by Nissl into several main groups by the varying relations of the cell protoplasm to the nucleus; thus the cytochromic cells, nerve granules, are bodies having a nucleus the size of a leucocyte with a small amount of stainable protoplasm surrounding it; karyochromic cells have nuclei of the usual nerve type but little protoplasm; and somatochromic cells are nerve bodies having a nucleus of moderate size with a considerable body of protoplasm surrounding it with a definite contour.

Besides the arkychromic and stichochromic cells there is the compound form, arkyo-stichochrome cells, found only in the Purkinje cells of the cerebellum, and the unimportant gyrochromic cells.

Our main interest lies in the somatochromic cells of the stichochromic group, comprising the all-important cells of the cortex, where the definite rod-like arrangement under normal conditions enables one to detect the slightest pathological varia-

tion. Nissl and others have recently demonstrated very pronounced changes in dementia paralytica of several types by his methyl-blue stain (*Neurol. Centralblatt*, 1896).

According to the most recent researches of van Gehuchten, given before the Moscow Congress, the achromatic substance between the granula does not consist solely of a simple fibrillary structure, as had been supposed by Nissl, Dogiel, Benda and others, but shows a much more complicated formation. It consists of a net-like organized mass and an unorganized substance,—the thread-like substance of Flemming,—and an unorganized portion, in which the protoplasmic net lies imbedded (interfibrillary substance of Flemming). These two substances are in direct continuation with the dendrites and axon processes, the only difference between dendrite and axis cylinder being that in the former they are more grained, in the axon more regular and distinct.

In this achromatic substance lie the chromophilic elements, which cling to the net-like substance, particularly at the points of intersection. Here the chromatic substance shows its customary fine granular structure. In portions of the cell the granules are accumulated in masses and form the variously shaped granulated or homogeneous forms. The varied arrangement of the granula in the protoplasm depends entirely upon the varying arrangement of the fibrillary network.

When one compares different nerve cells that belong to the same morphological type with one another, it is evident that there are differences in the staining properties dependent on a smaller or larger richness in the chromophilic elements.

Nissl in 1895 divided these varying conditions into several groups, each supposedly representing some functional state; the pyknomorphous being the quiescent, the apyknomorphous representing the exhaustion state of the cell. Van Gehuchten rightly says that these various conditions of the cell granula under physiological conditions belong to the most difficult subjects in histo-anatomy. Electric currents produce alterations of the cell contents, but the same changes may be found after section of the nerves (neck sympathetic and ganglia). More positive results have been obtained by Hodge, Mann, Demoor and Pergens, but even these are not unassailable. They, however, seem to show

that the nerve cell in a state of activity shows an increase in volume with a decrease in the number of the chromatic portions.

Within forty hours after the section of a nerve trunk, a rapidly spreading breakdown of the granula takes place (chromatolysis). This begins near the centre of the cell and progresses in every direction. The cell now increases in volume, and the nucleus wanders towards the periphery. The protoplasmic net remains unaltered. This stage lasts from twelve to twenty days, and eventually gives place to a period of restoration which progresses during seventy to eighty days to full recovery, when the cell returns to its pyknomorphous condition.

The above described cell alteration is not only to be found after section of a motor nerve, but also after ligature, after electric or chemical disturbance, and after various pathological processes, including inflammation. Restitution may take place after infectious troubles (Marinesco), but not after traumatic injury of the brain substance. The chromatolysis begins and seems most intense in all these conditions in the neighborhood of the entrance of the axis cylinder into the cell body. In alcoholic intoxications the chromatolysis is present mainly at the cell border.

Held's Modification of the Nissl stain, while troublesome, owing to the necessity of carrying the tissues through paraffin, gives most beautiful results. The sections should be very thin, and are stained in a warmed erythrosin solution for one to two minutes:

Erythrosin.....	1 gram.
Aq. dest.	150 "
Glacial acet. acid	2 gtt.

They are then to be washed in water, and are stained with aqueous acetone solution (1 part to 20), Nissl methylene-blue sol., equal parts, heated until the acetone odor is no longer apparent. The dish is allowed to cool, and the sections are then differentiated in a 0.1 per cent. alum solution until red, which may require only a few seconds or several minutes. They are then washed in water, and come successively into alcohol, xylol, and benzincolorphonium.

The Nissl granula are blue, the intermediate substance light

red, the nuclear membrane and substance red, the nucleolus and adnuclear particles blue or violet.

Thionin in aqueous solution has been advocated as a substitute for the Nissl methylene-blue, but has no real advantage. After previous preparation as by the Nissl formula, the sections are stained in concentrated thionin solution for from three to eight minutes, the solution being slightly warmed. Sections after staining should be lightly washed in water, differentiated in anilin oil and absolute alcohol, cleared in cajeput and zylol, and mounted in zylol balsam. Preparations by this method are only moderately permanent.

A new method of *Formol-Methylene* staining by *Rossilimo* (Neurol. Centralblatt, 1897) recommends itself by its simplicity. It is applicable mainly to the peripheral nerve bundles. They are first hardened in a 2 per cent. formalin solution, which, in the course of the second day, is replaced by a 4 per cent. solution, in which the specimens may remain until they are needed. The tissues are then changed to 95 per cent. alcohol for four or five days, are stuck to a cork with celloidin, and sections are made which are stained in a 0.5 per cent. aqueous methylene-blue, heated until bubbles appear on the surface. After the fluid has cooled, the sections are removed to a one per cent. anilin-oil solution in 90 per cent. alcohol, where they decolorize in from a few seconds to a minute according to the thickness of the section. They are then washed in 95 per cent. alcohol and in absolute alcohol, and are cleared in cajeput oil and mounted in balsam. The cylinder axis is tinged bright blue, the myelin is a light blue, with the Lantermann indentations defined. The nuclei of the Swan sheath are deep blue. In old animals granules, deeply stained, appear in the myelin, usually near the Ranvier nodules. Pathological alterations of the myelin and axon are readily detected.

Rehm's Neuroglia and Nerve Cell Stain.—The tissues are hardened in absolute alcohol, and sections are made after the piece of brain has been stuck to a cork with celloidin. First stain in a heated one per cent. methylene-blue solution for one-half minute. Take out the excess of color in 96 per cent. alcohol, and then counter-stain in 96 per cent. alcohol containing one per cent. fuchsin for fifteen to thirty minutes. Dehydrate with oil

of cloves, dry with filter paper, and mount in balsam. The nerve cells should be colored blue, the neuroglia a deep red. In pathological examples the nuclei and nucleoli are stained red in the place of the normal blue.

Ehrlich's Vital Methylene-Blue Method.—The vital method of staining nerve cell and fibre was first published in 1886, and while not at all adapted to pathological work, should be referred to as one of the most important of modern methods in experimental investigations.

A saturated aqueous solution of BX methyl-blue solution is made at a temperature of 100° F., and this solution in quantities of one to two cc. is injected under the skin or into a small vein of the animal selected for the experiment. Death follows after several injections, which should be made about twenty minutes apart.

The brain is now removed and divided into three or four pieces and these placed in a cold solution of *Bethe's Fixing Solution*, which is made from

Ammon. molybdate	10.0 gr.
Aq. dest.	100.0 "
Acid hydrochloric	10.0 gtt.

and the dish containing this fluid placed on a block of ice for twenty-four hours. The tissues are washed in running water for two hours and then go into ice-cold 80 per cent. alcohol for half an hour; afterwards into equally cold absolute alcohol, which is changed several times. From this they pass into zylol and then are imbedded in paraffin. Cut the sections, remove the paraffin with zylol, and imbed in zylol balsam.

Only the nervous portions of the tissue are stained, the glia remaining untinged.

For the demonstration of the gemmules of the nerve cells of the cortex, *Cajal* (Revist. Trimest. Micros., Vol. 9, 1896) recommends a modification of the *Ehrlich stain*.

Fresh pieces of the brain of a small animal are placed in a saturated solution of methylene-blue B, and after three-quarters of an hour are washed in salt solution, and are then immersed in

Ammonium molybdate	10.0 gr.
Aq. destil.	100.0 "
Acid hydrochloric	10 gtt.

for several hours, and the superfluous molybdate salt is removed by washing in water. The tissue is now fixed in

Formol	40.0
Aq. dest.	60.0
1 per cent. sol. platinum chlor.	5.0

for three to four hours, then washed rapidly in (0.33 per cent.) alcoholic solution of platinum chloride and imbedded in paraffin. Sections are then made and dehydrated in absolute alcohol containing (0.33 per cent.) platinum chloride, cleared in zylol and mounted in zylol balsam.

METHODS OF STAINING THE MYELIN SHEATH OF THE NERVE FIBRES.

Staining of the myelin covering to the axis cylinder is one of the most important of modern methods of examination and should never be omitted in examination for pathological details. The methods given below may be applied to the peripheral as well as the central nervous system.

THE WEIGERT STAIN.

The tissues come directly from Müller's fluid into alcohol of 80 per cent. strength, and eventually into absolute alcohol, then into thin and thick celloidin successively. The sections, after being slightly washed, are placed in a saturated solution of copper acetate diluted with an equal volume of water, where they remain over night in a warm place. They are now taken from the copper solution, are washed in water for a few minutes, and go into the staining solution, which is made from

Cryst. hematoxylin	1.0 gr.
Absol. alcohol	10.0 "
Lithium carbonat.	1.0 "
Aq. destil. ad.	100.0 "

Sections may remain for 12 hours in this solution at the room temperature, or they may be stained in from twenty minutes to half an hour by heating the solution containing the sections over the water bath. The preparations now appear dark blue or

black, and have to be thoroughly washed in water to remove the unoxidized hematoxylin, and are then decolorized in a mixture of

Borax	2.0
Kalii ferricyanide	2.5
Aquae destil.	100.0

This differentiation requires from fifteen minutes to two hours. Rapid decolorization is to be preferred to slow, as then the finest fibres do not lose their blue-black color completely. After the process is complete,—when there should be a distinction between the white and gray substances,—the sections should be washed very thoroughly in water, either in a large dish or in a current from a gravity bottle. The thorough washing is a necessity to avoid the presence of a disagreeable crystalline precipitate in the tissue, which will occur unless this part of the process is thoroughly accomplished. Dehydrate in alcohol, clear in zylol or bergamot oil, and mount in balsam.

The medullated fibres appear blue-black, the cells and ground substance are uncolored, or light yellow. Counter-staining is not desirable.

It is preferable to make only small quantities of the hematoxylin staining solution at a time, as it sometimes quickly loses its staining power.

Pal's Modification.—The hardening is the same as by the regular Weigert. The sections are laid in the Weigert hematoxylin for twenty-four hours at the room temperature, or in the warm chamber for one or two hours. Wash in water to which solution of carbonate of lithia in the proportion of one part of 4 per cent. solution to 100 parts of water is added. Differentiate in 0.33 per cent. freshly prepared permanganate of potass. solution until the gray substance appears yellow, which ordinarily takes one-half a minute.

Then decolorize in

Acid oxalic	1.0
Kalium sulphite	1.0
Aquae destil.	200.0

In a few seconds the gray substance will lose its yellow color, and the white will appear blue-black. Now wash thoroughly,

and bring the sections into a strong lithium carbonate solution, again wash, dehydrate in alcohol, zylol, balsam.

Should the specimens have been for a long time in alcohol, or should they be insufficiently penetrated by the chrome salt of the Müller's fluid, the sections can be immersed for an hour in a warm solution of bichromate potassium to insure the presence of sufficient chrome salt, which is essential to complete the staining reaction. The preparations made by the Pal method are very beautiful, but the finest fibres of the cortex are usually not colored.

Vassale's Modification.—The hardening, dehydration, and section-cutting are according to the method originally devised by Weigert. The sections are stained for four or five minutes in an aqueous solution of hematoxylin, are washed slightly, and carried into a saturated solution of copper acetate for five minutes, are then washed in water, and differentiated in the ferricyanide and borax mixture. Afterwards they are to be thoroughly washed, passed through the several strengths of alcohol required for dehydration, cleared in carbol zylol, and mounted in balsam. The hematoxylin solution should be made just before it is used. The method gives good results, and commends itself by reason of its simplicity.

The Marchi Method.—This method is of great service in enabling us to distinguish degenerated tracts in the cord and brain.

The tissues, cut into small pieces, are hardened for eight to ten days or longer in frequently changed Müller's fluid, and are then carried into a mixture of equal parts of Müller's fluid and one per cent. osmic acid solution. This mixture should be kept in the dark. This after-hardening takes a week to ten days at a temperature of 100° F., and the fluid is to be several times renewed, and the blocks of tissue turned at the same time, to ensure better penetration of the osmic acid.

The pieces of nerve tissue are now washed for twenty-four hours in running water, are hardened in alcohol, carried through celloidin, and cut into rather thick sections. In products from post-mortems that have not been very early performed, great care should be taken to avoid crushing the nerve substance, as artifacts are readily produced.

The degenerated medullary sheaths are colored black, everything else yellow or yellowish green. Degenerated fibres in peripheral nerves are equally as well stained as those in the central nervous system.

The *writer's modification* of the Weigert stain is applicable equally to the central or peripheral nervous system, and the finest medullated fibres of the cortex are fully stained. The portions of nerve tissue chosen for the investigation are cut into pieces 2 mm. thick and hardened in Flemming's solution for twenty-four to thirty hours. They are afterwards carried, without previous washing, into absolute alcohol, which is twice changed in the following day. If by this time they have acquired sufficient consistency to admit of very thin sections, they are placed in celloidin, in ether and alcohol, for 12 hours or longer, and are cut under 95 per cent. alcohol. The sections are carefully but quickly washed in water, and laid in a saturated solution of copper acetate, which should be heated on the water bath for twenty minutes to a half hour at a temperature of 100° to 110° F. After cooling, the sections are quickly washed in water to rid them of the superfluous copper, and are then placed in the staining solution, which, as it does not keep, should only be made as needed. Fifty cubic centimetres of distilled water are thoroughly boiled, and to it are added 2 cc. of saturated solution of lithium carbonate, and the boiling continued one minute longer, and then 1.5 to 2 cc. of a 10 per cent. solution of hematoxylin in absolute alcohol is added, little by little, with constant stirring. The flask is now well corked, and when cool is ready for use.

In this hematoxylin fluid the sections are placed, the dish set on the water bath and warmed to a temperature of 100° F. for fifteen to twenty minutes, or longer if needful. After cooling, the sections are twice washed in water, differentiated in the Weigert borax-ferricyanide solution diluted with one-third or one-half volume of water. The decolorization is rapid, and should not be allowed to proceed for more than five or six minutes, otherwise some of the finest medullated fibres will lose their blue staining. After decolorizing, the sections are washed in two waters, then go into alcohol, bergamot oil, and Canada balsam.

The finished sections have a black-brown color, showing little difference between the gray and white substances. Under the microscope, the medullated fibres, even to the finest, appear blue-black, the glia yellow, the nerve cells colorless; or in event that the chrome salts have not been completely reduced, the cells and their stouter processes are tinged brown-black. In the spinal cord the T-branchings of the nerve fibres can be distinctly determined. It is essential to the process that the sections be of great thinness in order to allow of quick penetration by the borax solution.

THE CHROME SILVER METHODS.

The *Golgi Silver Stains* cannot be commended except under unusual circumstances as useful methods for ascertaining pathological details. The Golgi stain is extremely uncertain in reaction, is liable to produce artifacts, and should never be used for tissues that are not of the most immaculate freshness, and have not lost their vital warmth before being set in the fixative solutions. Under such circumstances its usefulness is extremely limited, and it finds a place chiefly in experimental pathological research. With all these defects the methods are perhaps the most valuable ones we have at command in histological investigations, and have succeeded in revolutionizing many of our ideas of the construction of the central and peripheral nervous systems. While under all conditions uncertain, it has the great advantage, that when results are obtained they are positive, and no number of unsuccessful impregnations can invalidate one positive result.

The *Rapid Method of Cajal* is now the one in most frequent use. Small pieces of the tissue selected are cut into slices not more than 3 mm. thick, and are immersed for forty-eight to fifty-six hours in the following solution:

Bichromate of potassium	3 gr.
Distil. water	100 cc.
Osmic acid solution 1 per cent.	30 "

About ten cc. of the solution should be used to each cc. of cerebral substance. The temperature plays an important part in the hardening process and should be constantly kept at 78° or 80° F. Hardening in the dark is not absolutely necessary.

When the tissues have acquired sufficient consistence to be cut, they are rinsed quickly in water and plunged into 0.50 or 0.75 nitrate of silver solution, and after a few minutes the silver solution should be poured off and renewed. Ordinarily the reduction of the silver salt upon the nerve cells takes place in from thirty-six to forty-eight hours, and if it should be inconvenient to cut at that time, a small additional amount of the silver fluid should be added, as the precipitate is removed from the nerve cells by plain water.

The bits of brain or spinal cord should now be dehydrated in alcohol for a few minutes, stuck to a cork with celloidin, or set in a block of half-melted paraffin, and the tissue cut under 95 per cent. alcohol. The sections, which should not be too thin, are rapidly dehydrated in several baths of alcohol, cleared in origanum or bergamot oil, the excess removed with filter paper, and mounted without cover-slip in zylol balsam. If the balsam, after drying, should not completely cover the section, a second layer of a thinner variety can be applied, which will remedy the defect.

The best results with the silver method are obtained with embryonal tissues; those of adult animals should remain somewhat longer both in the hardening and silver solutions than foetal animals.

The nerve bodies and their dendrites are stained a reddish brown or black, the neuroglia reddish black, the axôn a red-brown. The vessels, which are often numerously impregnated, to the detriment of the preparation, are dark red or black. Fine and coarse precipitates often disfigure the preparations and lead to errors in deductions.

The writer's *Silver Phospho-molybdate Modification* gives a more constant staining of the lateral buds or gemmules upon the dendrites of the pyramidal cells than the above method. It also has the advantage that the tissues can be hardened in Müller's fluid and kept in it until needed, while the rapid silver method necessitates the treating of the tissues immediately, lest they may over-harden. The precipitate, too, is not so constant; indeed, sections are often obtained entirely free from it.

The portions of brain tissue chosen for the purpose of examination must be absolutely fresh to avoid artifacts; are cut into pieces not more than three millimetres thick, and hardened at

the room temperature (72°) for two weeks or longer in Müller's fluid, frequently changed. Specimens may lie in the fluid for a month or more without injury. They are then after-hardened in

Sol. potass. bichromate 3 per cent. 100 parts.

Sol. osmic acid 1 per cent. 30 "

According to the length of time the tissues have been in Müller's fluid they remain in the second hardening fluid for two or three days, are then washed in a weak solution of silver nitrate for fifteen minutes, and then go into a staining solution of silver nitrate of one per cent. strength, to each sixty centimetres of which is added two drops of a 10 per cent. phospho-molybdic acid solution. This staining solution should be made only as needed. The blocks of brain substance remain in the one per cent. silver solution for two, three or even six days, are removed, dried with filter paper, and rapidly dehydrated in successive changes of alcohol, are dipped in a celloidin solution in ether and alcohol, placed on a cork and allowed to dry for a few minutes in the air. The cork with the specimen is then placed in 80 per cent. alcohol, and the jar containing it placed under a current of cold water or on a block of ice for twenty minutes to half an hour, by which time the celloidin should be sufficiently hardened to allow of section cutting. The sections should be cut under 95 per cent. alcohol, dehydrated rapidly, cleared in bergamot oil and the excess removed on the slide, mounted in zylol balsam without cover-slip.

Nerve cells with the gemmulæ, neuroglia, and axons with their collaterals to the end-apparatus are stained a deep black. The blood-vessels should not stain.

The temperature of the hardening and staining fluids throughout the whole procedure should never be much above 80° or less than 72° F.; otherwise the cells will remain unstained and precipitates take place. Adult tissues do better by this method than embryonic.

Cox's Method.—In contradistinction to the ordinary chromate of silver formula, which only impregnates here and there a neurôn, this last method stains nearly all the cells in the cortex.

Small pieces of the brain substance are immersed for from two to six months in a fluid composed of

5 per cent. bichromate potass. sol.	20 parts.
5 per cent. bichloride mercury sol.	20 “
Aquae destil.	20 “
5 per cent. chromate of potass. sol. of strongly alkaline reaction	16 “

Sections are to be made on the freezing microtome and are then to come into a 5 per cent. carbonate of potass. solution, are washed in clear water, then quickly dehydrated, cleared in oil, and mounted in a quickly-drying balsam without cover-glass. Like the Golgi-Cajal method, that of Cox is adapted to embryonic work. The entire cell is stained a deep black.

Silver Nitrate in watery solution (1 to 400) is occasionally used for the demonstration of the endothelial lining of the blood-vessels and cement substance between epithelial cells, for example, in the pia mater. Better adapted to pathological purposes is a mixture of superosmic acid and silver nitrate mixed in equal parts of a one per cent. solution. The osmic acid hardens and stains fat-containing substances, while the cement substance and lymphatic substances are colored by the silver precipitate. The method is particularly adapted to fresh peripheral nerves.

GOLD IMPREGNATIONS.

Like the foregoing silver methods, the coloring of tissue with preparations of gold is most uncertain and tries the patience of the observer. Success once obtained often rewards for many failures.

Ranvier's Lemon Juice Method is perhaps in more frequent use than any other gold stain, especially for the terminations of nerve in muscle.

The object to be stained is placed in the filtered juice of a lemon for five or eight minutes, is washed in water and laid in a one per cent. gold chloride solution for twenty minutes. It is washed freely in water and placed in water acidulated with acetic acid (one drop to 25 cc.) for 24 to 48 hours, or reduced in the dark with diluted formic acid (one volume to three of water) and mounted in glycerine containing formic acid.

Arsenious Acid Gold is recommended by Golgi for the nerves of the tendons. Fresh pieces of muscle are treated with 0.5 per

cent. arsenious acid solution for a few minutes, then are passed into an 0.5 per cent. solution of gold and potassium chloride, afterwards in one per cent. arsenious acid solution, the final reduction being effected by the sunlight. They are mounted in glycerine.

The Method of Upson, while complicated, gives very beautiful results. The tissue is hardened in a 1 per cent., then 2 per cent., then $2\frac{1}{2}$ per cent. successively, bichromate of potass. solutions in the dark until of good consistency. It is now washed in 50 per cent. alcohol for two or three days, changing several times, then dehydrated in 96 per cent. alcohol, changed frequently until the blocks show a green coloring, which is usually the case in from three to four weeks. After the tissue has come out of celloidin and has been cut under alcohol, the sections are placed in a mixture of

Gold chloride	1 part.
Aq. dest.	100 "
Hydrochloric acid	2 "

in which bath they remain from one to two hours. They are then washed and immersed in a 10 per cent. caustic potash solution containing a trace of the ferricyanide salt of the same base for one minute, are then washed and carried into a 10 per cent. caustic potass. solution for one-half minute, and the gold is finally reduced in a freshly prepared mixture of

Sulphuric acid	5.0 grams.
3 per cent. iodine tincture	10 "

Mix and add perchloride of iron solution one drop. Do not allow the tissue to remain too long in the acid bath. The sections now show a rose tint. Wash, dehydrate, clear in clove oil, and mount in balsam.

As a general stain for the nerve cells of the central nervous system we would recommend the use of hematoxylin and eosin, particularly the slow-staining varieties of hematoxylin, carmine-nigrosine, the methylene-blue and magenta stains of Nissl, fuchsin, especially the carbolic fuchsin, after chrome-osmium hardening for the cell contents, and the Van Gieson picric-acid

fuchsin for Müller preparations. For an oversight of the cell contours, the chrome silver methods are best. For the medullated fibres the invaluable Weigert-hematoxylin and its modifications, and the Marchi method for degenerated nerve tracts, are to be recommended. For the axis-cylinder, including those of the peripheral nerves, borax carmine, or either the Ranvier or Upson gold staining, the Van Gieson method, nigrosine, or aniline blue-black, should be used.

The neuroglia nuclei are best stained by hematoxylin or safranin, the processes of the cells by the chrome-silver or aniline blue-black after the method of Lewis, or else by the method of Benecke, which is as follows:

Harden in alcohol, imbed in paraffin, stain in watery gentian violet solution (made of anilin 10.0; aq. dest. 100). Filter and add concentrated gentian violet solution, five to ten drops. Wash, decolorize in Lugol's solution, dry thoroughly with filter paper, flow anilin-zylol (two parts anilin to three of zylol) over the sections and immerse in zylol. As soon as the section is clear, mount in balsam. The neuroglia cells and fibres are violet, and the true nervous structures are unstained.

STAINING OF THE BLOOD-VESSELS.

Almost of equal importance with the accurate presentation of the nerve elements is the staining of the blood-vessels' sheaths, and an inquiry into the condition of the perivascular and connected cell-lymph spaces. The connection in the adult brain between the perivascular channels of the vessels and the lymph-sac surrounding the cortical cells cannot be demonstrated with the same clearness as in the embryo (Obersteiner); nevertheless in certain regions of the cortex of the cerebellum of the adult it is manifest, and without doubt the same condition is present in the cerebral cortex.

We are at the present time, to a certain degree, ignorant of the exact mode of passage of the nutritive plasma from the blood to the brain cells, and its return, when used, into the perivascular and pericellar channels. Around the adventitia of each artery and vein of the brain lies a lymph space named from its discoverer, His. Outwardly from this space is the proper brain substance, not separated by epithelial or endothelial lining, but

having an apparent condensation of the adjacent fibres of the neuroglia in the place of a true limiting membrane. This perivascular space may be traced along the smallest arteries, along the capillaries, and eventually along the veins, the only difference being that the lymph space of the vein is narrower than that of the arterial channel. Besides these lymph channels, which are not true lymphatics in the usual sense of the word, the aniline blue-black method of Lewis and the chrome silver stains have demonstrated a connection between the perivascular channels and certain of the neuroglia cells by means of a thickened arm, which is apparently channeled and attached by a broadened foot to the margin of the space. The silver method shows in certain experimental pathological conditions, notably that produced by ricin intoxication, that these vascular neuroglia cells become notably swollen, and within the perivascular channel, at the opening of the broadened foot, there is always a quantity of cell detritus, apparently coming from the extra-vascular broken-down cellular tissue. Sometimes this detritus is mingled with degenerating leucocytes, and sometimes the white elements of the blood are absent. It is fairly presumable, under these conditions, that the vascular neuroglia cells are excretory organs, removing the disintegrating cellular particles from the yet living tissue, as in the cited cases of ricin poisoning, where the death and partial destruction of the nerve cells has been taking place at a rapid rate, yet there is present in the tissue immediately adjacent to the disintegrating cells but a limited amount of cell debris, and the sole available agency for removal is through the medium of the tumefied neuroglia cells. From these pathological facts it is presumable that under normal conditions of functional activity the plasma of the blood, after passing through the capillary walls and permeating the surrounding tissues, and in the course of time having lost its oxygenizing and vitalizing qualities, is taken up, together with the waste products of cell metabolism, by the vascular glia cells, which are located by the hundreds along the margin of the vessels, and thrown into the general return circulation by means of the channeled arms of the cells. Bevan Lewis has advanced a somewhat similar theory, with the addition that he figures the neuroglia cells attacking diseased nerve cells and feeding upon them, a function equivalent to the absorption of a

dust particle by a leucocyte, a form of activity which is hardly probable, indeed is inconsistent with their apparent function under normal conditions, which is to take up and remove waste products, not to destroy the living organism. In the pericellular lymph-sac debris is rarely found; in the capillary spaces it is rather rare. Lymphoid corpuscles are occasionally found in the cell lymph-sac, though in very small numbers.

The whole subject is one replete with interest to the physician interested in mental diseases, especially in paresis, where the stoppage of the pericellular spaces with leucocytes, fixed nuclei, and the detritus of several kinds of degenerated cells is customarily found. The outflow of the lymph from the intimate tissues of the brain in the same disease, through the thickened and choked meshes of the pia, could be studied with interest and profit, and would give rich additions to our knowledge of the pathological anatomy of the disease.

The vessels themselves may be examined either in teased preparations or in sections, where they show in transverse or longitudinal cut, according to the direction of the knife stroke.

For teasing, a small bit of the brain substance may be macerated in diluted alcohol or in weak chrome salt, or even in methylene-blue salt solution for a number of days, and then picked apart with needles. Staining with weak solutions of silver nitrate is also used for the endothelial lining, but the addition of osmic acid to the fluid, as already given, affords better results. The teasing method is more applicable to the finer capillaries than to the larger vessels.

In the sections, hematoxylin in combination with eosin gives for ordinary purposes the best differentiation between the various layers of the vessel. It can be used with either bichromate or alcohol-hardened tissues. Nissl's magenta gives a clear depiction of the endothelial nuclei, but does not show the smooth muscle cells. Flemming preparations stained with safranin or carbolic fuchsin slightly warmed, stains all the nuclei of endothelial, muscular, and adventitial layers. If the preparations are well hardened, the osmic acid contained in the chrome-osmium-acetic acid mixture will stain any fatty particles, though it is perhaps better to stain in one per cent. osmic acid for this purpose. The chromophilic particles of the nuclei are brought out in beau-

tiful detail by safranin-Flemming, and any mitosis that may be present can be observed, as well as degenerated states of the nuclei. Van Gieson's stain brings out amyloid and hyaline degenerations of the vascular walls in an exquisite manner. Solutions of picric acid, Lugol's solution, and tincture of iodine, can also be used in detecting amyloid. Pigmentation of the capillaries, hematoidin crystals and debris, calcareous degenerations and aneurismal dilatations, are shown equally well in unstained or in hematoxylin preparations. Fatty degenerations of the intima and adventitia are best determined by osmic acid, pseudo-hypertrophy of the muscularis by hematoxylin or carmine, as well as in the safranin preparations. Colloid degenerations stain intensely in borax carmine. Some of the various kinds of debris found in the pericellular spaces will not stain with any of the ordinary dyes, or take up sufficient eosin to become visible. The lymphoid cells stain with hematoxylin, thionin or methyl blue. Proliferation of the fixed cells of the adventitia is best determined in hematoxylin preparations. In the so-called fibrillary degeneration of the brain capillaries Lepinsky (D. Arch. f. klin. Med., 1897) recommends that small portions of the brain substance be macerated for twenty-four hours in a 0.5 per cent. lactic acid, washed in water and stained for twenty-four hours in picro-carmine. They are then washed, placed on a slide, and crushed by a pressure upon the cover-slip, so as to form a thin, transparent layer of the macerated tissue. The capillaries are thus brought into view over considerable stretches and can be further treated by iodine, caustic soda and other reagents.

For the vascular contents, eosin and hematoxylin, methyl-blue, thionin, and safranin may be used to bring out the various kinds of cells.

STAINING OF THE END-TERMINATIONS OF THE SPINAL NERVES.

Since Sherrington (*Journal of Physiology*, 1895) definitely determined that the nerves of the muscle-spindles (Muskelknospen, Koelliker) were continuous with nerve fibres passing to the posterior roots of the spinal cord, the end-apparatus of the nerves of the muscle and skin has achieved a new importance in pathological investigations, as these peculiar structures are supposed to degenerate in various diseases and to remain intact in others.

The fibres passing to and from the cord have different destinations, principally to the skin, muscle and sinew. The periosteum and bone, though supplied with medullated nerves, have not been fully studied.

The skin nerves have a variety of endings. In the stratum Malpighii they pass between the epithelial cells, and end free between them, after repeated branchings, in the form of a rounded or slightly pointed ending closely adjusted to the epithelial cell. Besides these free endings there are quite a number of interesting nervous structures lying within the substance of the cutis and the contiguous mucous membrane, of which the tactile corpuscles, together with the even more peculiar Pacinian bodies, are the most prominent examples. Nothing positive is known at present of the deportment of these bodies in organic nervous diseases.

More interesting, and better studied, are the nerves of the muscles and their relatives, the sinew spindles of Golgi.

All the end-organs naturally fall under two classes, motor and sensory terminations. The first are found, in mammalia, in several forms, the principal being a repeated division of the medullated fibre into small knob-like endings (Retzius), or the ending may be in the form of a terminal plate of rounded or Ç-like form, having a peculiar structure, the nerve fibre after losing its medullary covering spreading out in arborescent form, imbedded in a kind of granular material.

Various methods of staining these end-terminations of the skin and muscle are in service. Of these the Ranvier gold chloride method seems to give the best results. Osmic acid and picrocarmine are recommended by Homer. Maceration of the muscle in dilute osmic acid gives a fairly good preparation of the motor plates. Staining with aqueous solutions of fuchsin or safranin shows the chromatin contents of the numerous nuclei along the sheath of Henle. The Ehrlich methyl-blue stain gives perhaps the clearest pictures, but only applicable to comparative histological studies.

Sensory Nerve Terminations.—The muscle-spindles, the organs of muscular sense, which conduct to the central organ impressions of the muscular contractions (Langhans), are the most important of these structures. As a description of them is not

to be found in any text-book in the English language, it may not be inappropriate to give a short description of their histological construction. The sense-organ is a spindle-shaped body having a length of 8 to 10 mm. and a breadth of 0.1 to 0.2 mm., situated among the fibres of the striated muscles of the body (exceptions are to be noted to this rule in the ocular and diaphragmatic muscles) or in the muscle contiguous to a tendon. It has a sheath of concentric lamellæ resembling the sheath of Henle of a medullated fibre. Within the sheath is contained a number of small striated muscular fibres, the average being five to eight. At one point in these fibres nuclei increase in numbers until they completely fill the fibre, then, after a short distance, the fibre again becomes striated. Several nerve fibres having a medullated sheath, varying from two to ten in number, enter the pole of the spindle and terminate principally upon the muscular fibres and between the fibres and the sheath. There is still some doubt as to the eventual form of distribution of the nerve terminations, though it is almost certain that the form of ending known as a motor plate is absent.

Besides the nerves, the spindles are well supplied with blood-vessels and lymphatics which have their entrance and exit near the point of penetration of the central nerve. The lymphatics have their greatest development in the central region of the organ.

A number of writers have in recent years detailed the results of their investigations upon these bodies, the most important works being by Forster, Babes and Blocq, Langhans and Batten. The weight of the evidence so far collected is that when there is a lesion affecting solely the motor portion of a nerve trunk, the muscle spindles do not show any degeneration of their nerve fibres or of the muscular cells therein contained, while in lesions affecting both the sensory and motor fibres the nerves, in common with all other terminal organs of the muscle, are found degenerated, but the muscular fibres intrinsic to the spindle remain for a long time intact (Batten). Babes and Blocq, however, considered the muscle spindles in a case of myopathy to be pathological in appearance, a result that has not been substantiated by others. I append in tabular form the results obtained by two of the most accurate of recent investigators:

BATTEN.

MUSCLE SPINDLE IN

Infantile paralysis, normal.
 Tabes dorsalis, Muscle fibres, normal, Nerve fibres altered.
 Myopathy, normal,
 Progressive muscular atrophy, normal.
 Peripheral neuritis, probably normal.
 Section, or injury to nerve trunks leads to atrophy of the muscle fibres of the spindle.

LANGHANS.

MUSCLE SPINDLE IN

Myelitis, normal.
 Muscular atrophy, normal.
 Bulbar paralysis, normal.
 Tabes, Muscle fibres and other portions of structure normal, the nerve fibres uncertain, but in all spindles examined they were present.
 Cretinism, alterations in capsule, presence of abnormal deposits of mucin, changes in the connective tissue of the inner portion of the spindle.

Forster thinks the spindles are altered in myopathy.

Various methods for the demonstration of these peculiar and interesting nerve end-organs, or rather beginnings, have been used. Ranvier's, or some other of the many gold methods, have been in frequent application. Carmine and eosin hematoxylin have been employed for their demonstration in sections. The ordinary Marchi method, or Babes' modification (hardening in $2\frac{1}{2}$ per cent. bichromate of potass. solution, with after-hardening in diluted Flemming at a constant temperature of 75° F. for three to four days), is useful for determining if the nerves are degenerated. Batten has found Sihler's method of staining the best suited for the spindles; a portion of fresh muscle, taken below the entrance of a nerve bundle, is taken and divided longitudinally into thin strips, or, better, frozen and cut into thick sections, and these are macerated in

Acetic acid I part.
 Glycerine I "
 Sol. chloral hydr. in 1 per cent. dist. water. .6 "

The tissue is to remain in this fluid for 24 hours, then is immersed in glycerine for two to three hours. The muscle fibres are now pulled apart (with the frozen sections this is not necessary) and stained for three to ten days in

Ehrlich's hematoxylin I part.
 Glycerine I "
 Chloral hydrate sol. 1 per cent. in dist. water. 6 "

The muscle spindles after this treatment can usually be detected by their darker staining, and the portion of muscle in which they are imbedded teased out under a magnifying glass.

Other methods, the gold excepted, require sections to be made. A simple method of staining the nerve fibres of the spindles is the following: Fresh preparations, or those already hardened in chrome salts, are carefully picked to pieces and a few drops of glycerine and picro-carmin added to the slide, which is placed in a warm chamber for twenty-four hours. The superfluous fluid is now removed and the teased tissue covered with a glass. The axis cylinder is stained a beautiful red.

The sinew spindles were first described by Golgi, and, together with the Vater organs of the tendons, have the same relation to sensation and muscular sense as the already described muscle spindles. They may be quite readily demonstrated by the arsenious acid gold method, by the Ranvier-Fisher method, and by the admixture of osmic acid and silver nitrate already given. The preparations obtained, especially by the gold methods, belong to the most beautiful in the peripheral nervous system. More work could be profitably done in this line to determine the intimate relations of the nerve endings to the sinew fibrillæ and their relation to the nuclei.

STATE CARE OF THE INSANE.¹

By P. M. WISE, M. D.,

President State Commission in Lunacy, New York.

There is no controversy relative to the duty of a community to care for those who cannot care for themselves; neither is it questionable that the care provided shall be humane and worthy a benevolent people. It has been said somewhere that the degree of civilization in every country can be measured by the standard of its charities. If there are other more exact measurements, we have the fact remaining that our most Christian and civilized peoples give their dependents the greatest attention. And this is not wholly the result of unselfish principles, but it largely comes from the methodical tendency towards preparing for fortuitous misfortune; and the belief that as we do to others so may we expect for ourselves.

The insane are those unfortunates who can least care for themselves, and their numbers and requirements have been so extensive that not only for the welfare of the community, but for their own good, they have by universal consent been a common burden, and provision has been made for them by taxation where voluntary contributions have not been sufficient. Insanity has been the one sickness of the human race to remain unrecognized as such, long after the great enlightenment which medical science gave to the world; and even at the present time there is a lingering doubt in many a cultured mind whether demoniacal possession may not be a better explanation after all for some manifestations of insanity, than a diseased brain. These doubts, however, seldom reach expression, and we must assume a universal tacit admission that insanity is the result of disease and should be treated as such.

Well, how shall it be treated? For many centuries the insane

¹ Address before the Conference of Charities, Baltimore, November 23, 1897.

were treated as criminals. The brain was the only organ in the body which was subject to contempt when it became disordered. Even in the days of Paré, when surgery was making rapid strides, when the grosser organs of the body were being carefully studied, the subtle disorders of the brain, upon the material stability of which depends the expression of the very soul of man, were treated with contumely, and to be devoid of reason where reason was once enthroned was to be disgraced. Even now, in the present era of enlightenment, the occurrence of an attack of insanity often becomes a social barrier to the individual, however complete may be the recovery from it. If the great public would recognize insanity as a symptom of a disordered brain, which it is, and not as a disease *per se*, which it is not, it would effect a change in sentiment regarding it. It is a condition, however, recognized by all as unfitting the individual for the ordinary avocations of life, and throwing him upon the mercy of his nearest of kin, and when they are unable to care for him, upon the community at large, for proper care and sustenance. The wage-earner becomes dependent, and, when upon him rests the support of a family, we have one of the saddest sights of this serious life. It is thus that the burden rests so largely upon the community, for no other disease to which the body is subject brings with it such complete discomfiture and misery, frequently far-reaching and ending only with life. It is, therefore, unjust and unfair to class these unfortunate victims of disease with paupers and criminals. Voluntary pauperism and crime are first cousins, but dependence caused by insanity has no relationship to either. It may be, and frequently is, an incident in a blameless life. There is no equity in establishing dependence as a basis of judgment upon the insane. The State, as the largest factor of government, owes a duty to its reason-dismantled citizens, and that duty is imperfectly met when it places pauperism, crime and insanity in one classification.

It would appear from the record of the State of Maryland that this duty has been discharged imperfectly and upon the theory that an unpleasant function easiest forgotten is soonest performed. It is true that you have built some excellent curative institutions and have recently started a new one which is to be a model of its kind, but, if I am correctly informed, you have approximately

a thousand of these unfortunate human beings, your brothers and sisters in the sight of God, in your almshouses and jails, associating with voluntary paupers or criminals, without proper nursing or medical care, depending upon the wishes and the sentiment of the local keeper for quantity, quality and variety of food and clothing; and, worse than that, depending upon unskilled persons for the treatment of the unbridled passions let loose by disease, which require for their proper management a thorough knowledge of the human mind and brain. If this be true, I fearlessly say to you that you are far from being prepared for the new century, and you have no time to spare if you would enter it with a clean record. Maryland has a world-wide reputation for philanthropic work. The names of Moses Sheppard, Samuel Ready, Johns Hopkins, R. S. Steuart, Enoch Pratt, Mary Garrett and many others have brightened Charity's garment until it shines the world around. How sincerely is it to be regretted that such a medieval stain as almshouse and jail refuge for the insane should mar its brightness.

There is one feature in benevolent work that may be properly termed commercial. It is the practical question which has been largely solved by charity organization. It is, in short, the best application of means to an end. I can say without fear of successful contradiction that any State which has not taken to itself its immemorial prerogative in providing for, directing and supervising its insane wards, has neglected the commercial feature of its benevolent work. In plainer terms, I mean that it pays the State to dispense its charities methodically—by business method. Sentiment is valuable in forming and sustaining policies, but public sentiment alone, unless it is supported by an argument that appeals to the tax-paying voter, often falls short of results. And right here is where State care for the insane has the best of the argument. In using the term "State care" I do not wish to be understood as meaning the mongrel variety—half State and half local. It is not required that I call the attention of such an audience to the frequent failure of divided responsibility. No, I mean the assumption of the State's right and duty to provide for, direct and supervise the care of all the insane, all the time, and to make it a misdemeanor for a local poor officer to receive into his custody an insane person except

for transmission. It is only by imperative laws that abuses can be avoided. The State of New York has had an experience within the past ten years it would be profitable for other States to study. It is only within a decade that nearly ten thousand of its insane have been removed from county and municipal support and care to the sole care of the State. To accomplish this required a battle that has left many scars, but I doubt if the worst enemy of the movement would openly assert to-day a belief that for any honest interest there should be a return to the former system of misrule. The "local interest," so-called, will always be found against a movement towards what they term "centralization"; and what does it mean? One of the worst types of the old municipal government of New York says it means patronage and perquisites on the one hand, and this has been shamelessly used as an argument against the principle of State care. It must be granted there are honest and well-meaning objections urged against the removal of the insane from county-houses, but they are not sound and will not stand analysis. They are numerous and cannot even be referred to in the time at my disposal.

I learn from an address delivered a few months since by Dr. Edward N. Brush, to the Medical and Chirurgical Faculty of Maryland, that the conditions existing in this State to-day relative to the care of the insane are quite similar to those in New York ten years ago. You have made provision for approximately 700 out of an insane population of 3000, of which 1800 are now in custody. Thus about 1100 are supported in county or municipal almshouses or asylums. I have no fear of contradiction when I state that the care and treatment accorded to these 1100 insane is not what it should be, either under the requirements of science or measured by the dictates of humanity or the demands of the progressive spirit of the epoch.

And now, begging your patience, let me enter into this question in greater detail. *What must you do to be saved* from the ignominy of almshouse care for your insane? You have, or will soon have, two admirable insane hospitals, than which there are none better. The strong arm of the State should support and extend these hospitals to enable them to gather all of the insane now in almshouses to their beneficent care. Create a State

lunacy department and endow it with executive power; not confine it to visitorial and reportorial functions. Make your statutes so strong that a local poor officer's relation to a case of insanity will not extend beyond a period necessary to inform its district hospital of the case and give the necessary temporary care awaiting the trained nurse's arrival to take charge of it. Make it a misdemeanor for a local officer of the poor to receive into his custody any person who may be insane or mentally defective in a degree which your laws may safely define. And then in order that your taxpayer may have ample protection, place the support of your institutions upon a business basis, upon a commercial basis if you please, but make it liberal enough to be effective.

And will this liberal policy, if adopted by your State, increase the burden of the rates? I must admit I am not acquainted with the arguments that may have delayed suitable provision for your insane, but if human nature and human motive in New York and Maryland are alike, my experience leads me to believe that one of the chief claims made by the advocates of local, or county, or almshouse care is that the insane can be maintained at much less cost in county than in State institutions. In truth, we may assume that the whole case of those opposed to State care centers in this claim, for human credulity can scarcely receive any pretense that any county can do more in its poorhouse for the physical comfort and humane treatment of the insane than the State can or does do for them in its specially constructed hospitals. I have no doubt that very specious arguments may be advanced to show that an equal standard of care to that maintained in the State hospitals may be obtained in the county institutions, but it is self-evident that such a claim is unfounded. In a very careful comparative analysis of cost of maintenance of the insane under respectively county and State care in New York, in which it was quite impossible to get all the items of cost under the county system, it was shown that in thirty-two counties the tax rate for the support of the insane under the State system was decreased, while in twenty-eight counties it was increased. The average was slightly increased to the approximate equivalent of seventeen one-hundredths of a mill on each dollar of the assessed valuation of property in the State, so that

a farmer taxed upon an assessment of \$10,000 would have an additional annual expenditure of one dollar and seventy cents to insure humane treatment of the dependent insane. For the past year a general tax levy was authorized by the Legislature of one and one-tenth mills for the purposes of the department of the insane of the State, and out of this appropriation must be paid the cost of all buildings constructed, of all repairs and improvements, and the maintenance in full of what is technically known as "State care of the insane."

As applied in New York, the term "State care for the insane" implies provision and maintenance for all the dependent insane of whatever class in State hospitals. The basis upon which the State hospital system is established and organized is (1) a division of the State into hospital districts; (2) each hospital to receive and care for all of the dependent insane, both acute and chronic, of its district; (3) a healthful, picturesque and accessible site, with an acreage large enough to furnish occupation and ample recreation grounds and for agricultural purposes, with sanitary drainage and abundance of water; (4) hospital buildings of a permanent character designed and arranged upon scientific principles for the proper classification of the insane of its district and equipped with modern sanitary appliances for warming, ventilating, lighting, fire protection, cooking and all the operative requirements for the safety, physical comfort and cure of its inmates; (5) a skilled, sufficiently large and liberally paid medical staff, including women physicians and specialists for the treatment of the eye, ear, teeth, etc., as well as a corps of medical internes as adjuncts to the regular staff, thus using the hospital as a means of instruction; (6) a liberal corps of skilled nurses trained by a regular course of study and practice in the schools of the several hospitals upon a well-digested and approved plan, the proportion of such nurses and attendants to the insane averaging as one to eight; (7) a liberal and varied dietary designed on a physiological basis to meet all the nutrient requirements of the patients; (8) sufficient clothing, bedding and furniture, designed and prescribed by experts; (9) the most varied and ample means for the occupation, diversion and entertainment of patients, not only to increase their comfort and content, but to be applied under skilled medical supervision for their curative

effect; (10) all medical and surgical appliances for the most recent and progressive treatment of insanity in any of its forms; (11) the selection and promotion of officers and employes in accordance with civil service principles, a permanent tenure of office during fitness and efficiency, and entire freedom from the baneful influence of politics; (12) a uniform system of medical and financial operations and records, and monthly conferences of all the executive officers of State hospitals with the State Commission in Lunacy for consultation; (13) the removal of patients from their homes or from poorhouses to the State hospital by trained nurses of the same sex, and, where necessary, accompanied by a hospital physician at the expense of the State, and a statutory prohibition of all jurisdiction of superintendents of the poor or other local officers over the insane after they have been certified as such; (14) the maintenance of a central pathological laboratory with a full staff of skilled scientists co-operating with and for all the State hospitals, and (15), finally, the whole to be under competent central supervision, having the power to correct abuses, maintain discipline, enforce economy, and the whole to be maintained by the State by means of a general State tax levied for that specific purpose.

As a result of the complete operation of this system for the past number of years, of the 21,000 insane in custody in the State of New York there is not one in a county asylum, a poorhouse, a jail or a penitentiary unless temporarily apprehended for commitment to a State hospital. There is no doubt in my mind that with the experience up to this time in the State care of the insane, it is nearly the unanimous opinion of the tax-paying members of the commonwealth that the State of New York's experiment in humanity is a success and that it pays to be scientifically humane.

In the foregoing remarks, I wish to be distinctly understood as not reflecting upon the existing Commission in Lunacy of Maryland. My contention is specifically a reflection upon the laws of Maryland, for, if I am correctly informed, the powers of the Commission in Lunacy are chiefly of an advisory character. Their public documents record their deprecation of the existing condition of the insane in this State, and their recommendations have pointed towards the creation of better provision for them.

I contend, however, that, as having the knowledge that must come to them from personal observation, they may be reasonably criticised for permitting the following public utterance to remain unrepealed: "In the opinion of this commission, no almshouse is a proper receptacle for insane persons unless it is provided with rooms so constructed as to safely detain such insane without the use of chains or ropes, for the reason that such treatment is well calculated to magnify the mental excitement of the unfortunates, and almost precludes the possibility of recovery." Until this resolution is substituted by one which substantially and emphatically declares that, in the opinion of the commission, no almshouse, under any circumstances or under any conditions, or however provided, is a proper receptacle for insane persons, it may safely be assumed they have not given the public and the legislature that advice which, as one of their official functions, may be expected of them. The fact that the State has not made provision for all the insane, and that the almshouse is the only expedient, even if a temporary one, is no excuse for the approval of the almshouse as a receptacle for insane persons; but from a supervisory and advisory body should issue at all times, and in the most public manner, appeals for the proper recognition of the claims of those whose darkened minds prevent them from urging their own. But in order to effect the best results, your commission should have more than advisory functions. It should be fully empowered and charged with the execution of the laws relating to the custody, care and treatment of the insane. It should be charged to provide the accommodations for the prospective needs of the poor and indigent insane of the State, and be held responsible for the proper execution of this duty; and then it should be supported by appropriate legislation which will enable it to execute with fidelity its fiduciary capacity as a trusted agent of the commonwealth. Must every reform depend upon an ebullition of public sentiment or public indignation? Cannot a calm, deliberate consideration reach a proper conclusion of the proper balance of the debit account of our relations and duty to our fellow-man? Then why, may I ask, should so manifest a requirement as the proper care of the insane await a general uprising before your wise men and leaders give it cognizance? We know that revivals have been necessary to effect

lunacy legislation from the time the saintly Miss Dix swept so large a surface of our globe with her irresistible appeals for mercy and relief for the insane for humanity's sake, but it is incomprehensible why it should be so, unless we admit that the insane are forgotten in the rush and hurry of life. Better, aye, a thousand fold better, that we resort to a Borgian method of lethal euthanasia for these forgotten non-producers, even if we violate a commandment, than permit them to consort and linger with the criminal and his relatives if we cannot afford to do our brotherly duty to them. Yes, either this or provide them with proper care and the benefit of all available relief measures. No middle course should be tolerated in this progressive epoch, and the demagogue's appeal to the burdened tax-payer should not be heeded, for it is delusive.

As far as possible individual effort to give aid to the care of the insane, as toward any eleemosynary provision, should be encouraged. You have in Maryland more instances where private fortunes have been devoted to the public good than perhaps any State of the Union of equal strength, if not without limitation. The recent instance is the bequest of Enoch Pratt, which is most timely, and a class, unable to pay for the full cost of their maintenance and treatment, still desiring to retain that modicum of independence which comes from partial support, and having absolutely no retreat, will thus be amply and beneficently provided for. All the dependent insane are indigent, as distinguished from sane dependents or voluntary pauperism, but the public hospitals have a full budget in carrying out any provisions that may be created by the legislature looking to State care. The Pratt legacy, therefore, combined with the Sheppard bequests now in such successful operation, will prove a valuable adjunct to State care, and give Maryland what seems desirable for any State—provision for the partially indigent insane.

There are many questions relative to the kind of provision which the State should make for its insane, but they are quite subordinate to the great fundamental principle of "State care." When this is firmly established by statute, and if possible by constitutional provision, then the important but minor question of how the State shall proceed to discharge its trust may be undertaken. It would seem that your present complete hospital

organizations are sufficient to carry into effect the primary movement of State care. In New York it has been found, after a hospital organization is established and the operative plant is equipped, that subsequent accommodation can be added at the rate of five hundred dollars per capita, including complete equipment. Upon this basis a half million of dollars would enable Maryland to remove all her insane now in almshouses and jails to State institutions, and the subsequent provision for the annual increase of the insane would be a comparatively small consideration. By appropriate designs, having in view a classification of the entire insane population of a defined district, a large community can be ministered to without embarrassment and with positive advantages over the small asylum. Classification can be made more complete. The various diversions and occupations for the insane can be increased to meet the needs of a larger variety of cases; and by segregate construction, the whole can be as harmoniously administered as any well-to-do and prosperous village of equal size. The State hospitals of New York vary in census from 500 to 3500 in single communities. The advantages of a hospital of 2000 and over are quite apparent, and the smaller institutions lack a diversity of features that it is possible for the larger institutions to enjoy, although they may not be absolutely requisite for the well-being of the patients.

A feature of custodial care of a proportion of the insane under public supervision, as now practiced in Scotland and in the State of Massachusetts, is worthy a reference. It is the placing of the harmless and able-bodied insane, who are partially able to support themselves by labor, but unable to do so except under supervision and direction, in families willing to undertake their care and support for a small return. This in Scotland is known as the "boarding out" system, and eighteen per cent. of the total insane population is thus provided for. In Massachusetts the number provided for in families is approximately 150, and is annually decreasing. It cannot be doubted that in Scotland, where family care has been practiced successfully, the public has been relieved of a considerable burden. Success in an equal degree has not been attained in Massachusetts, although at one time an earnest effort was made in its behalf. New York has been unwilling to lend its aid to this experiment, for the ostensi-

ble, if not the nominal purpose of the State in assuming the care of its insane, is to give them that observation and treatment which sick and irresponsible people require, and which insane persons may require unexpectedly and without premonition; hence they should be at all times within the reach of skilled aid. It is not in the power of man to tell when a diseased brain may break from its apparently permanent but abnormal moorings and launch the individual in irretrievable disaster. It has been maintained that the insane are sick and irresponsible, and if they are it is the duty of the State to give them the benefit of appropriate care and treatment, and if they are not, their care can safely be left to other eleemosynary provision.

In the sixth annual report of the State Commission in Lunacy of Maryland I find reported, at the close of that year, 1781 insane in custody, including those in the almshouses. In the eleventh, which I believe is the last report of the Commission, it is stated that the number of insane persons confined in different institutions, including almshouses, is 3105, of whom 378 are colored. This enormous increase in five years, approximating seventy-five per cent., is quite incomprehensible, and I am inclined to be skeptical regarding the correctness of the reports. This increase is mentioned because it would be reasonable to expect that if the State made adequate provision for the insane, many that are now kept in families because their friends are averse to having them detained in almshouses, would emerge from their hiding-places and would receive the care which their condition required. Under such circumstances an increase in the number in custody might be reasonably expected. Under the present conditions it is inconceivable that any family, however destitute, would willingly submit to the removal of their kin to an almshouse. It matters not whether separate buildings are constructed for the insane and are called asylums. As long as they remain under the unit of county government a proper separation of classes cannot be effected. The strong arm of the State must support its mentally defective wards, and the experience of years has shown that no lower unit of government than the State has ever been able to effect it. Not only provision for this class is needed, but a correction of your laws with reference to the insane—their commitment, detention and release from custody, increasing the

powers and responsibility of your central lunacy department, and clearly defining them.

In the State of Maryland to-day, if I am correctly informed, the iron handcuff or chain is in use, fetters which were stricken from the insane in France by Pinel more than a hundred years ago. Of the approximately one thousand insane in these receptacles, which for the insane are remnants of a past age, there are only fifty paid persons who directly or indirectly are engaged in their personal care. In twelve of eighteen almshouses in which insane are kept, I learn from their reports there are no nurses or attendants except those obtained from other inmates. Of these more than nine hundred insane, seventy-four, or more than eight per cent. are subjected to mechanical restraint, and forty-one, or about five per cent., are maintained in solitary seclusion. According to the reports of your Commission, there have been insane persons in your jails continuously for the past five years suffering from a form of insanity which is universally recognized as requiring the most careful and judicious treatment.

Arouse yourselves, sons and daughters of Maryland! Sweep the cobwebs from your statute books, remove this stain from the otherwise fair fame of your progressive State, and let future generations know that from this year began an appreciation of the proper relation which should exist between the whole-minded and free-willed and those whose mainspring of life is broken.

MEDICAL EXPERT TESTIMONY IN THE KELLEY MURDER TRIAL.¹

By WALTER CHANNING, M. D.

It has been so often the province of the alienist who has testified as an expert in a trial to find cause for criticism in the way his testimony has been presented and utilized, that it is with a feeling of the greatest satisfaction the writer can say that in the case under discussion there could be no just ground of complaint. On the contrary, the experts' opinions were received with respect and consideration, and exerted an important and considerable influence in determining the final issue of the case.

The precedent of the proper method of introducing medical expert testimony in a murder trial, which this case may be instrumental in establishing, is of such value and interest that the writer will undertake to present a somewhat detailed account of the medico-legal aspects of the case.

The circumstances of the homicide were these: Shortly before two o'clock on the afternoon of April 16th, 1897, the dead body of Joseph A. Stickney, cashier of the Great Falls National Bank of Somersworth, New Hampshire, was found on the floor of the bank. Death had been undoubtedly produced by numerous blows on the head, some of which had crushed the skull, and by cutting the throat from ear to ear, evidently with a razor; a black-jack or billy was found near the body, which accounted for the blows on the head.

The vault had been rifled of nearly all the gold and silver it contained, amounting to several thousand dollars, and a valuable package of stamps, the property of the postmaster, was missing. No bonds or stocks had been molested.

Suspicion quickly pointed toward Joseph E. Kelley, a young man who had lived for several years in Somersworth and the

¹ Read at a meeting of the Boston Medico-Psychological Society, December 16, 1897.

town of Berwick across the river. Three days afterwards he was arrested in Montreal and made a frank and full confession of the crime.

The cashier of the bank was an old and somewhat feeble man, seventy years of age, respected and esteemed by those who knew him, and his brutal murder aroused the indignation of the community and a strong feeling of hostility toward the murderer.

During the summer following the crime, experts were engaged by the counsel for the prisoner to examine into his mental condition, which led to the employment of others by the State for a similar purpose. This procedure was rendered peculiarly necessary in the case under discussion, as the law of New Hampshire specifies that "where insanity is set up as a defense to an indictment, the jury must be satisfied beyond a reasonable doubt that the killing was not produced by mental disease."

The experts selected by the State were Drs. Edward Cowles, George F. Jelley and the writer, and they made several prolonged examinations of the prisoner in the county jail at Dover. Under ordinary circumstances it would have been desirable to have visited him singly, as well as in a body, thus seeing him under the most varied conditions. The prisoner's counsel, however, preferred usually to be present themselves with one or all three of their own experts. This resulted in a combination investigation, which, while it eliminated the disadvantage of a possible personal bias on the part of the investigator, did away with the accuracy and exactness resulting from a close and continuous investigation along one single line. Often a man in the presence of a dozen other men is quite unlike the person wholly alone with one other man. In a multitude of counsellors there is sometimes safety for him who is seeking to *escape* the consequences of their counsel, as well as for him who seeks to gain advantage from it.

The situation with Kelley then was this when the experts for the State first saw him: he had previously seen his counsel and some of the experts employed by them a number of times, and had acquired a familiarity with their system of probing and sounding him for evidences for and against mental unsoundness. While he could form no idea of their precise purpose, it was possible for him to gain a facility in responding, and it happened

that he had the ready and quick perception which materially helped him in accomplishing this purpose. Thus it was that we found him ready and alert in answering innumerable questions, and the writer felt that he had so many times rehearsed most of what he had to say, that without in any sense feigning a part, he had come to use instinctively whatever his agile wit enabled him to pick up as something coming quite spontaneously from himself. It appeared that he was able to manufacture lies where truth would not serve, and he had become a composite of Kelley plus, not only his counsel and the alienists he had seen, but newspaper reporters, detectives, fellow-prisoners and most of the persons he had seen since his arrest. It will thus appear evident that it was no easy task to analyze satisfactorily such a mental conglomeration, especially in the presence of a large number of both friendly and hostile inquisitors.

The better to understand the man we were called on to thus examine, it becomes necessary to describe his appearance physically and mentally. His measurements were as follows: Height, 5 ft. 4½ in.; weight, 170 lbs.; length of head, 190 mm.; maximum width head, 146 mm.; minimum width head, 122 mm.; horizontal circumference head, 555 mm.; length face, 132 mm.; width face, 120 mm.; width between eyes, 26 mm.; length orbit, 34 mm.; length nose, 56 mm.; width mouth, 49 mm.; width jaw, 115 mm.; cephalic index, 76.31+; length left ear, 59 mm.; width left ear, 30 mm.; angle left ear, 50°; length right ear, 58 mm.; width right ear, 31 mm.; angle, 50°. The palate (see Plate I) was a little higher and longer in proportion to the width than normal. Parallelism of the alveolar processes was a striking characteristic. Teeth were regular and comparatively sound.

While the measurements of the head reveal no striking abnormality or asymmetry, there was a slight flattening on the right side in the parietal region and parietal depression of a congenital character on both sides. About the middle of the left frontal bone there was a small cruciform scar, and under it a depression rather smaller than the end of the little finger, which could be seen as well as felt.

The type of head was medium dolicho-cephalic; in appearance, however, brachy-cephalic, but not in reality, the pompadour cut of the hair making appearances deceptive; thus the hair

standing up straight in front two or three inches high made the forehead appear higher than it really was. The accompanying outlines of the head give an approximately correct idea of its contour (see Plate II).

The hair was dark and rather coarse.

The eyes were brown and tending to the almond type. The skin was clean and smooth. The arms and legs were well proportioned; the hands rather large for the body. The general appearance was of physical symmetry and the roundness and plumpness of the young boy or girl. The color was bright and fresh and ruddy enough to suggest perfect health.

Coming now to a description of what we may call "psychophysical characteristics," the facial expression deserves special mention. No correct idea can be formed of it from the accompanying picture (see Plate III). There was something attractive and winning, almost fascinating, about it, which was very much enhanced by a smile lighting up the whole face. It was easy to get an impression of ingenuousness and even innocence, in spite of his evil deeds, as one looked into his face. There were no furrows, no suggestions of hardship, suffering or sorrow in any facial lines; nothing but a broad, flat, round visage with the happy look of untroubled youth. The mouth was rather small, the lips thinnish, the lower jaw somewhat heavy. A subtle look of cunning now and then could be detected; but it was the negative character of the expression, as far as any betrayal of emotion was concerned, that struck the writer's attention. There were no evidences in the face that anything in life had so far reached down below the surface. There were indications of coarseness and lewdness to be observed on a very close inspection, but not to a sufficient degree to mar the general effect of good-natured boyhood.

As Kelley faced the various experts and others grouped around him, most of them note-book in hand, it might be thought that the situation would have been an embarrassing one, considering the gravity of the situation for him, but the embarrassment was on the side of the experts, rather than on Kelley's side. He carried himself with such self-complacency and answered all questions with such ready frankness that for some time it seemed as if he must be playing a part, with a view to creating an impres-

sion favorable and helpful to his own case. It was of course possible for him to have adopted some definite line of action, supposing that he was bright enough to have reasoned it out, which would have presented indications of some form of insanity. While he never at any time actually feigned specific symptoms, it looked a little at first as if he had seized on certain salient points, which he lost no opportunity of bringing into the foreground. And the probability is that he saw that the inquiry was directed to the finding out of a particular kind of data, and he thought he would give us all we wanted, and so his story grew and grew, being a mixture of truth and fiction. Yet as time went on it was evident that he followed no definite plan in what he said, and often (from any point of view he could have had of his own) he made admissions more injurious than helpful to his case.

Without reproducing here in detail much of what was elicited in our examinations, attention may be properly called to some of the principal points which, if later proved to be true, would have a positive value as evidence of mental weakness; while on the other hand, if shown to be false, would militate against such a theory.

First may be mentioned his account of an uncontrolled tendency to steal money and articles of little or no value from his early youth up to the time of his final arrest. He stole a watch and chain when he was about ten years of age; money from his father and from his employers, as well as various articles from them. He stole a tent, which he used in some woods near where he lived and for the larceny of which he was sent to the reformatory; articles at the reformatory; small sums of money from the hotels where he was employed for nearly three years shortly before the crime, as well as numerous small and cheap articles, such as hair brushes, tooth brushes and so on. The money he took from guests' bags, the hotel cash-drawer, the cigar stand, and the safe. There were several features of this pilfering from hotels which deserve notice, the first being the smallness of the amounts taken; the second, the cunningness of execution, so that it was not found out; and the third, that the money was not spent on drink and women, but saved and put into the bank with other money earned; and the fourth, that he kept a record of all the

money he stole, meaning to pay it back when he was twenty-five, a statement to be immediately explained.

Second may be mentioned his statements about his having a contract with the devil, beginning when he stole the watch, about the age of ten, and to expire when he was twenty-five. He never attempted to thrust this devil story into his conversation, but was ready to detail it if encouraged to do so. He had both seen and talked with the devil, he said; though there was evidence that he resorted to fiction in describing him, it appeared probable that he believed a portion of what he said. He frankly confessed that he had been brought up to believe in the conventional devil, but this one was different. He had a dark complexion; eyes like drops of water; dark hair streaked with grey, and a deep bass voice. When asked how tall the devil was, he thought it an immense joke to say, "as tall as you"; he could not help dropping into cheap or vulgar buffoonery when occasion offered. At our different interviews he mentioned categorically, though with constantly added details, what the devil said and how he behaved. It was most difficult, in fact impossible, for the writer to get at Kelley's real idea about the devil. The thing that was the most genuine and had some hold of him was his compact with the devil, which, as already mentioned, was binding to a certain time. He honestly believed in a personal devil, and thought he was in his power. As to how he looked and behaved, he made so many statements that it was easier to believe he was lying, than that he had actual delusions and hallucinations. There was without doubt something in the devil story, but just how much importance to give to it could not be determined during the examinations.

Third, he had had three attacks of somnambulism.

Fourth, he had had syphilis and at various times immoral relations with women.

Fifth, he never drank to excess.

Sixth, though he was very amiable, hail-fellow-well-met, and was generally liked, he had no intimate friends or comrades except a respectable girl with whom he "kept company." As a result of this peculiarity he was able to conceal his constant and curious thefts and his other bad practices for years; even his sweetheart did not receive his full confidence.

Seventh, the way he committed the crime, and his relation to it, was most strange and unusual, and became more unnatural each time that he talked of it. He seemed to actually delight in telling about the murder, and was never happier than when he was narrating its most terrible details. He no doubt had long thought of robbing the bank, and had taken a room opposite for the purpose of watching what went on. Not long before the murder he had stolen a pistol which had been found in his room, and he was in trouble about it, but such details did not upset him. A few days before the murder he went to Boston and bought a false moustache, black-jack, chloroform and straps. While he told no one of what he intended to do, it cannot be said that he took extreme care to conceal his movements. The things that had almost always diverted suspicion from him were his reputation of being good-natured and inoffensive, and his having had no intimate friends or pals to betray his wrongdoing, and had he had the shrewdness to realize his advantage in these respects and exercised ordinary self-control and judgment, the crime might never have been discovered. That he was lacking in these qualities the evidence later to be referred to makes especially clear.

With the greatest gusto he related how he watched the bank at the noon hour on the first day he made the attempt to rob it, to see the female assistant cashier go out, leaving the cashier alone. How he then went to the bank in a partial disguise, intending to pass himself off as a detective, his plan being to tell the cashier that a gang of "crooks" intended to "crack the safe," having already connected wires with it, which he would locate if the cashier would take him to the safe. By this means he would gain access to the safe, and have a chance to assault the old man at the same time. He failed in the accomplishment of this plan, because the assistant cashier had not gone out to dinner, and he went away so hurriedly that he left a bundle on a window seat in the bank entrance containing some of his outfit for the robbery. Later, when he was in an oyster saloon, he remembered that he had left his bundle and went back for it.

The murder was committed on Friday. During our examinations he insisted on it that his first visit to the bank was made on the previous Wednesday, and that all the time between Wed-

nesday night and Friday morning up to half-past ten o'clock was a blank to him. It was, however, proved by evidence presented at the trial that it was Thursday, and that on that day he appeared in every way as usual. He undoubtedly was lying about his condition on Thursday, having for some reason got the idea that it would be advantageous to his case to prove that he had periods of unconsciousness, of which this would be a most desirable illustration.

On the fatal Friday he wrote in his room or office an order for some stamps belonging to the postmaster, which were in the bank safe, watched until he saw the old cashier was alone, then with his black-jack, razor, chloroform, straps, disguise, and a pillow-case stolen from his boarding-house, repaired to the bank shortly after twelve o'clock. Some of his things were done up in a paper parcel. It is a question in the writer's mind whether he contemplated murder. Like a boy, he had armed himself to the teeth, but that alone would not be proof in such a fellow as Kelley that murder was intended. What he wanted was the money in the safe. Whether he went as far as to plan the details of a murder and just what he would do afterwards is, in spite of considerable evidence to the contrary, open to doubt. Even what he said himself is misleading. He asserted that he did intend to commit murder. Once he said he thought of it in his office; another time he said it was on his way across the street to the bank. But these answers were made in response to leading questions and cannot be too implicitly relied on.

Arriving at the bank, he handed the old cashier the order for the stamps. They were promptly given him through the window, and not, as he had probably expected, through the door in the wire partition between the front and back part of the room. His next move was to ask the cashier to take his package and keep it until the next morning. That brought the old man to the door in the partition, and then it was that he felled him to the floor. Just what went through Kelley's mind as he rained the blows with his black-jack on the defenseless cashier's head can never be known. He says himself: "He opened the door and I struck him. When I struck him the first blow he fell right to the floor. Then I kept on striking him as hard as I could. Well, when I struck him I felt blood on my face; it was

like sweat. Then I took my razor out of the case and cut his throat." This description of what would ordinarily be the very climax of horror, and from the narration of which one would suppose almost any criminal, however hardened, would shrink, Kelley delivered with care and deliberation, and with an air of pleased satisfaction, as if he felt sure of the sympathy of his auditors.

The cashier being disposed of, he took a little money out of his (the cashier's) pocket-book and the bank keys out of his pocket, and locked the outside door of the bank. Next he proceeded to rifle the safe of the gold and silver, putting all but a few dollars into the stolen pillow-case, also the package of stamps. Then he threw away in the bank two or three of the things he had brought with him, donned his disguise and prepared to leave.

At this point he apparently became frightened, and his presence of mind partially deserted him. His own explanation was that he saw through the glass panel of the bank door the face of the devil, who was holding the handle of the door and grinning at him. This so upset him that he turned to a window to escape, but looking around again he saw that the devil had gone. Then he went to the door, but was too frightened to unlock it, so he smashed the heavy plate glass with his foot, got through the opening thus made, hurried down the stairs, and made his exit from the building.

Such is in brief the account of the crime as given by Kelley up to the time of leaving the bank. His subsequent movements, which are of some medico-legal importance, can best be considered in connection with the evidence.

Eighth. A point to which special attention should be called was his conception of the difference between right and wrong, and other moral distinctions. His lack of any feeling of remorse for his crime, or any realization that it was a thing of which he should be ashamed, has already been referred to. He was, perhaps, not proud of it, but he did believe it to be rather a creditable performance. He said himself in detailing his conversation with the devil: "I was glad I had killed Mr. Stickney. I felt good and was tickled to death." Then he went on to say: "I had no reason for thinking I had done a good thing. Think (now) I had done wrong. Sometimes not sorry

I did it. It will benefit some people. There is no one dies but somebody grows better or worse. I have always noticed in families one grows better or worse. . . . I have come to this conclusion from observation. When I die people will grow worse, because they are all good now. I would like to feel sorry for killing Mr. Stickney, but I can't; I can't make myself believe so." Later in the same conversation he said: "I think no murderer is ever forgiven. I have asked God to wipe this thing all out, but he won't. It does no good to pray. I shall not be forgiven until January 16, 1899, when I am twenty-five years old (when the devil compact expires). God will not help me any now. The devil has got hold of me. . . . I can't excite myself to feel any compunction. I don't feel for anything nor for anybody."

When talking with him on other occasions he said "he knew it was a dirty, cowardly deed," but he never felt or showed any feeling of sorrow. He seemed to realize this and to regret it, and said he'd rather feel bad than the way he did. "I want some one to pray for me to be sorry. I am too happy now. . . . I am going to plead not guilty because the lawyers want me to, but I am guilty. I had rather be hung than go to prison, because this (the latter) would be paying fifty cents on the dollar, and I had rather pay my whole debt." He said at the close of one long interview: "Doctors, lawyers and reporters are all alike, they are all professional liars." Another time he told us he knew what we were there for: to make him out insane, but he was not insane.

Ninth, mention should be made of Kelley's poetry. He was told by his counsel the last day we visited him that we would like to hear some of his poetry, so with the greatest good nature he went to his cell and brought out a blank book into which he had copied a number of his poems. He read them standing up, in a clear, self-confident schoolboyish tone of voice, pleased rather than otherwise with the effect they produced. The poetry-writing began three months before. One day he said he found that the words in a letter had a tendency to rhyme with each other, and since then he had had no difficulty in making poetry. How much value should be attached to poetry written as this was while he was confined in prison as a noted criminal, perhaps somewhat exhilarated and with a sense of his self-importance, it is difficult to determine. Especially so, it may be said, as he

was pressed to write poetry, if we may judge from his letters, and for this reason he may have applied himself more diligently to the task than would otherwise have been the case. In a letter under date of July 18th, 1897, for instance, he says: "I have written four poems, and my lawyers want me to write a lot of them." In estimating the significance of the poetry-writing, these circumstances must be taken into account.

The following samples will give one a fair idea of the kind of poetry Kelley seems to have written:

DREAMS OF BOYHOOD DAYS.

As he sat there alone,
Thinking of the years gone by,
Of the happy home and mother,
From his heart there came a sigh.
The sisters and the brothers,
The shaded lover' lane,
The old seat by the running brook,
He ne'er shall see again.

The roses in the garden,
The cerious nightly bloom,
All is still and fragrant
'Neath the silvery shining moon.
The twinkling little stars,
The beautiful northern lights,
These sights he ne'er shall see again
On balmy summer nights.

On the door stoop by his side
With the one he loved so dear,
He spoke in pleasant whispers
That none but she might hear.
The swaying elm trees,
The waving fields of grain,
The little girl he loved so much
He ne'er shall see again.

No more the golden sun will see,
No more the rising moon,
Nor the white sails on the ocean,
Nor the screeching big black loon.
The earth is still the same,
The waters ever run;
But the poet's life is ended,
His work on earth is done.

(JOSEPH E. KELLEY.)

THE 20th CENTURY GIRLS.

When girls are little babies,
They cry, they scratch and bite;
And papa has the pleasure
Of rocking her at night.

She is a little darling,
A precious little child;
But when she cries and hollars
She makes poor papa wild.

When at the age of sweet sixteen,
She still has her childish ways,
It's strange that she remembers them
Most all her live long days.

She sits down in your lap,
She bites, she hugs, she kisses;
Me thinks at times our sweet sixteens
The nursing bottle misses.

(JOSEPH E. KELLEY.)

WILL.

Dover, N. H., Aug. 16, '97.

Hung by the neck until dead
Is very easy to say,
And this is to be my fate
In January, on the sixteenth day.
Yes, the sentence has been passed,
Dead is all future hope;
The people of Strafford County
Have got me on a rope.
I do not wish to make a will,
For I have few bequests to make;
In the shape of bloody weapons,
Which I give for remembrance sake.
The razor which cut the throat
Of the cashier of the bank
I give to James A. Edgerly,
A lawyer of high rank.
He is after all such things;
A kind of souvenir crank.
His office is at Somersworth,
Quite near the savings bank.

To my junior counsel, Mr. Ryan,
I give the small black-jack
With which I struck the kind cashier
A well-directed crack.
The straps and chloroform
You may equally divide;
They led me to the awful crime
By which the cashier died.
As my counsel and advisors,
I trust that you will see
That after I am dead,
Dissected I shall be.
Bancroft of Concord may have my body,
If to experiment he feels inclined.
He then can tell the people
All about my mind.
The last thing that I ask of you,
Let no friend see my face;
But remove me from the prison
To Doctor Bancroft's place.
And after he is through with me,
Cremated I wish to be.
If justice is only satisfied,
It's all the same to me.

(JOSEPH E. KELLEY.)

THE CONVICT'S PRAYER.

A prisoner on an autumn day
On bended knees to God did pray:

O God! in Thy mercy and holy love,
Send down Thy blessing from above.

Give me sorrow for every sin,
That Thy love and friendship I may win.

Like the fading, dying flower,
Thou canst save me by Thy power.

Help the lawyers in my case
By Thy holy loving grace.

Although they lie, and against Thee sin,
They are working cheap, for I have no tin.

And while they sit about the hearth,
In time You can give them a nice warm berth.

Help the doctors, of Thee I beg,
For they are pulling the county's leg.

If they much more my caranium drum,
They will put the county on the bum.

But, good Lord, have mercy, and lay not up a feeling,
It's the best and safest way to do the sin of stealing.

Have mercy on the ladies who practice salts and pills,
And show them how to do like men, to send in nice big bills.

Forgive the sheriff, of Thee I pray,
And help him on election day.

And if a vote or two is bought,
Make his life—as jailor very short.

As high sheriff he will pass,
Though he has the manners of a big jackass.

His wife, God bless her, I don't think,
Has driven him crazy, to rum and drink.

God bless the attorney-general, and the county attorney, too,
And should they go to Heaven, don't place them in the zoo.

God bless the judges, so solemn and calm,
And keep them from spiritual and bodily harm.

God bless the jury, one and all,
The young, the old, the large and small.

Give them grace to consider the case,
And on facts and evidence their opinions base.

God bless us when we are laid at rest,
And take us to the land of blest—

The land that ever is the same,
We ask of Thee in Jesus' name.

Amen.

Kelley's letters written in the jail, of which the writer has examined about twenty, are similar in tenor to his conversation. They show only a fair amount of facility of expression, but are

written carefully and in a handsome hand. They were probably all seen before being mailed, which may account for their correctness and carefulness. They were nearly all written to members of his family, and chiefly to a sister. He refers in several of them to his relations with the devil and of the impossibility of his doing right while under his influence.

In a letter written May 14, 1897, he says: "I am a child of the devil, and you need have no fear for what I have done. I am not as bad as you think, and know God knows the trouble I am in. I expected to live until I was fifty, and half of my life was for the devil and half for God."

In a letter written on the 30th of April, 1897, he says: "I don't feel as though I have done anything, but of course I have, but it does not make me feel as bad as I ought to feel."

May 22, 1897, he writes that "Life on earth was hell to me, but here I am at ease and happy. . . . About five years ago my Guardian Angel told me to go to see Bishop Bradey and he would drive the devil off, and now I am going to write him and ask him to bless me and I shall feel safe."

In several letters he says he is very happy, and that "prison is heaven to what the outside world is," meaning probably that he feels that he will be prevented in prison from yielding to the devil's influence and doing wrong.

There is one letter written about three weeks before the murder which appears to be in every way a common, plain, direct letter. In several of the letters severe remarks are made about the experts' visits. One dated August 4, 1897, is written to Dr. Bancroft, and is as follows: "My lawyers lied to me; don't come any more, for I am all right. You are a man that likes to see justice done, and so am I. Will be in Concord in October and will tell you something good at that time." (He refers to going to the State prison when he speaks of being in Concord in October.)

In estimating the value of the letters as evidence, it must be remembered that they were written while he was under the watchful observation of his counsel and a number of experts, and he might (had he been feigning) have been cunning enough to make use of them to express his irrational ideas. It is more probable, however, that he expressed himself as he really felt, and hence they tend to corroborate the statements he made in conversation.

Such is a partial report of the investigation at the jail into Kelley's mental condition. At its close the writer was strongly impressed with the feeling that he was not playing a rôle for the

occasion; that he was *himself*, and only acting out what was natural to him. He had always lied and with some cunning trimmed his sails to the blast of the moment. It was natural for him to be shifty and tricky, and he was not above taking advantage of subterfuge. Still his desire was to be frank and straightforward, as no doubt his counsel told him it was best for him to be, and his lying was justified, in his opinion, when it would make the truth of his statements more apparent. On the whole he stood the ordeal wonderfully well. Probably no feigner could have gone through so many long days of severe and rigid cross-examination without at least partially breaking down. At the end, as at the beginning, he was the same pleasant, happy, superficially sharp, self-reliant boy. He had always had plenty of egotism, which no doubt the notoriety of the crime had materially augmented, still it was far from having the quality of obtrusiveness and aggressiveness characteristic of the so-called "paranoiac."

It was apparent that he was not the subject of any form of insanity, but it was equally apparent that he was quite unlike the ordinary young man of twenty-three. While he had a quick, wide-awake way of taking things in and some degree of so-called smartness, he had no maturity of judgment. His lack of moral sense was, however, the most striking indication he presented of an undeveloped mind and character. The conclusion was inevitable that he was a degenerate with congenital or acquired criminal instincts.

How far he could be held responsible for the crime was at the end of the examination a difficult matter to determine satisfactorily, and fortunately it was not necessary to give an opinion until all the evidence had been presented at the trial.

Kelley was the same happy, good-natured boy when he appeared in the court-room that he had been in the jail, and was evidently pleased to be the observed of all observers. He was neatly and tastefully dressed, and healthy and attractive looking. Each step in the proceedings he followed with interest, and was on the *qui vive* to give his counsel hints or advice, a thing he could easily do, as he sat in the bar close beside them.

He listened carefully to the simple and direct yet forceful and convincing opening address of the counsel for the State. It

was arranged that the jury should visit the scene of the murder, and in accordance with the law of New Hampshire Kelley went with them. He rode to the bank from Dover in an electric car with the lawyers, some of the experts, newspaper men and sheriffs, and he was the most cheerful and unconcerned member of the party. He acted as master of ceremonies at the bank, showing the exact spot where the old cashier met his death. His non-chalance and total lack of appreciation of his crime and its consequences, combined with his jocose yet pleasant and polite manner on this occasion, were something incredible in the man of sound and normal mind.

The evidence presented by the State proved easily and conclusively that he was guilty of the murder. Its medico-legal interest consisted in the account of his strange actions both before and afterward. These actions showed recklessness, carelessness and bungling, and a great lack of judgment. The brown paper he used to do up some of his things in, and in which he probably intended to wrap up the stolen money, he borrowed in a conspicuous way of a local tradesman, and then he left it in his haste at the bank door after he had committed the murder. There was little difficulty in tracing this paper directly to him. The order for the stamps, already spoken of, was in his own handwriting, and he left that in his haste on the bank counter. The stolen pillow-case, also already spoken of, he slung over his shoulder, walked out into the street with, and then took through streets where he was seen (though not recognized because of his disguise), to an orchard where he was seen. Here he left it covered with his coat, and after changing his hat he went to his boarding house, calmly eating a little dinner. He then hired a horse and buggy, ostensibly to go fishing, and returned to the orchard (being seen by several persons) to get the money, putting it into a dress-suit case, after which he again returned to his boarding house and paid his landlady out of the stolen money part of the sum he owed her. His next move was to drive some miles to the town of Milton, where he put his horse in a stable (the horse showing evidences of rapid driving) and bought a new coat and hat, leaving his old hat in the livery stable. He enquired if there was any one who sold glasses in the town; went to a hotel, where he met an old acquaintance;

took a train bound toward Canada; on the train kept a good deal to himself, yet spoke to several persons, some of whom he had previously known. He gave the stolen stamps to a brakeman to mail for him, paying him liberally for doing so. They were directed to "L. J. Sullivan, Montreal," the letters "L. J." being the initials of Sullivan the pugilist reversed. The stamps were carelessly done up and mailed in such a peculiar way that the postmaster decided they had been stolen and would not forward them.

It is impossible to minutely follow each step in Kelley's movements in the limits of this paper. It must be stated, however, that by a series of what appeared to be rather haphazard changes from one train to another, he finally turned up in a little Canadian village named St. Justin de Newton, telling a very plausible story (about coming to Canada on account of trouble he got into by selling liquor) to the keeper of an inn where he lodged. On the Monday, three days after the murder, he bought a woman's dress and bonnet of the innkeeper, paying an exorbitant price for them, which he wished to use for a disguise, he said, to go to Montreal to see his wife who was there, and he proposed to bring her back with him. The dress was that of an old woman and entirely out of keeping with his apparent age, but that did not seem to trouble him, and he took the train for Montreal, going straight to a house of ill-fame. All such houses had been warned of his possible arrival, and the police being notified, he was immediately arrested and before the next morning had confessed the crime. After taking the officers to the place where he had thrown away some of the money, he returned to Somersworth without a requisition, and was his usual pleasant, congenial self on the journey. Such are the facts relative to his conduct after the murder, presented and proved by the State.

He could not well have pursued a course which would furnish more clues, once suspicion turned toward him. Instead of covering his tracks, he left them visible up to the time he changed, as if by sudden impulse, from one train to another. He was temporarily safe perhaps on Sunday when in the small country inn, and his best chance lay in keeping himself hidden from sight, but the reckless, hare-brained boy in him impelled him to go to a city and have a spree. He could not have more adroitly

thrown himself into the hands of his pursuers than by visiting a house of ill-fame, his reputation being just shady enough to suggest his doing such a thing. Disguising himself as he did illustrated his cunning and recklessness, but it only aided him in walking directly into the lion's mouth.

Carefully analyzing all that he did after the murder, the conclusion is forced on one that he acted with little judgment and foresight, threw away such opportunities as he had for escape, and stupidly and without reason allowed himself to be caught.

The prosecution having put in their case, the defense next outlined in their opening what they would rely on to prove the claim of insanity. Said Mr. Ryan, who made the opening address:

You have heard the story of the crime and a partial account of this young man's life. You have noted the many peculiarities of this remarkable homicide.

To these facts and circumstances we desire to especially call your attention, and that of the physicians, as showing in a measure his mental condition. The boy was born in Amesbury, Mass., on the 15th day of January, 1874. He was the fourth of a family of eight children, all living.

The prisoner was born a healthy, well-developed child, and grew up to the age of four years a bright, happy, laughing child, until a fatal day in September, 1878, while at play with another child upon what is known as a carriage brow, he met with an accident. The place from which the boy fell was a distance of from 12 to 14 feet from the ground. He was picked up unconscious and so remained for two or three days.

A witness will say that he went to the place where the accident happened and picked up a board with a common tenpenny nail driven through it. He says the nail was rusty, and he noticed that there was blood upon at least a half-inch of it. The nail looked as if a small piece of it had been recently broken off.

During the period that the boy was confined in bed from the injury he suffered from what are commonly called fits or convulsions, and he continued to have fits up to about the age of 13 or 14.

When he was 15 or 16 years of age he used to say that the devil was here or there, or in his room or somewhere all the time. He did not care for money at all. He one time took two \$5 gold pieces, and one he gave to a boy and the other he battered with two stones. He was 10 or 12 years old at that time. Another time he took a gold watch and chain from the house and gave it to a boy for a New York pictorial newspaper.

He was sent to the reformatory because he took so many things that did not belong to him. One day he was passing along the road with two other boys and he saw a man in a field at work. He had a revolver in his pocket and he took it out and fired twice at the man. He did not

know the man, and when he was asked why he did it he would make no reply. Once he shot himself in the arm.

He seemed to be always afraid, and kept a sword in his room to defend himself with, and always carried a revolver in his pocket. He wrote a letter to his father while he was at Grant's Hotel, stating he was going to build a hotel on a hill in Amesbury; that it was to cover two acres of land and be the finest hotel in the country, and that he was going to entertain all the nobility of England in it. When he was in the Concord prison he wrote a letter in regard to an elephant, in which he said: "You done a good job on the elephant. I was watching you. He tried to crush you up against the wall, but you knocked him down with the hammer and put the shoe on him in good shape."

We shall have a number of witnesses from Amesbury who will testify as to his having fits and his peculiarities when he played ball, and that they regarded him as a foolish boy.

It will appear that as he was released from the reformatory he went to Somersworth and there undertook to obtain employment. We shall show you conclusively that this prisoner never had the capacity to hold any position of any kind or description that could not have been held or filled by a boy of 10 years.

The above is in substance, as taken from the *Boston Herald*, a portion of the opening for the defense. It was closed by an appeal to the jury on the nature of the responsibilities which they assumed, as the issue to be determined was one involving life and death.

The life at stake being Kelley's own, it was both interesting and important to notice how he behaved during his counsel's address, when for the first time he was hearing how his case was to be defended. Sitting, as he did, side by side by the experts, there could not have been a better opportunity to watch him. Now, as always before, however, he was the same pleasant, cool, jocose Kelley. He was quick to catch any little point and preserved a critical, observant attitude, not indifferent to what was going on, but absorbed in it. Yet all the time it was impossible to discover that he had the slightest conception of the magnitude of the crime or his relation to it. A *Herald* reporter very accurately pictured him in the following paragraph:

"He listened with great attention to what Mr. Ryan said, and when references were made to his devil he looked toward the *Herald* reporter and laughed. He also smiled frequently at Mr. Nason, counsel for the prosecution, who sat beside him while the opening was being made. When the statement was finished

Kelley told Mr. Ryan he thought it was a pretty good speech, much better than that delivered by Mr. Nason, and he said he did not think he got such a hard roast in it after all.

"Kelley's composure was not a bit disturbed by the generally interesting events of the day. He was as cool when the detectives were telling about how he acted at the time he was arrested for murder as when Mr. Ryan gave information to the jury about the thefts of his boyhood days. Sometimes he bit his lips at the talk his attorney made about insanity, but there were no other signs of nervousness."

The opening of the counsel for the defense occupied the closing portion of the afternoon session of the third day of the trial, and it had considerable weight as corroborative evidence of Kelley's peculiar mental condition, because it furnished an explanation of doubtful points in his account of himself, and further made it more possible to understand his boy-man make-up and his stunted moral nature. Though of course the statements made in the opening had not been proved to be true by evidence duly passed upon by the court, yet enough data had already been unofficially obtained by the writer to warrant him in assuming their probable accuracy.

Of great corroborative value also was Kelley's conduct in and out of court, especially during his counsel's address. It was in every way consistent with his conduct in the jail.

Thus little by little enough cumulative proof had been collected to focus and define the writer's opinion of Kelley's condition, which had been only partially arrived at after the examinations in the jail.

Upon the evening of the same day the counsel for the State and their experts held a conference, and later the experts of both sides conferred together. While in some respects they differed in their opinions, they were all prepared to go as far as to say that Kelley's brain was imperfectly developed, and that, in the full sense of the word, he was not responsible.

Such being the unanimous opinion of the experts, the counsel for both sides decided that Kelley should the next morning, at the opening of the court, retract the plea of "not guilty" and substitute that of "guilty." This he did in a neat little speech addressed to the court, delivered with a cool, self-possessed

manner and in a clear voice. The gist of what he said was that he would plead guilty provided he could have an extension of sixty days. What he meant by asking for this amount of time was, that if he was sentenced to be hung, the law of New Hampshire delaying the execution of sentence for one year, the sixty days extra would carry him to the time when his compact with the devil would expire and he could die a free man!

Kelley's plea of guilty made a remarkable change in the method of legal procedure, as what up to that time had been a jury trial became a hearing before a judge! A jury was no longer necessary under the law of New Hampshire, guilt being admitted. The responsibility of determining the degree of guilt is placed on the judge, and this depends on whether deliberation and premeditation can or cannot be proved.

It was a striking and never-to-be-forgotten moment when the jury, the supposed bulwark of justice and personal freedom, was dismissed, and on the judge alone was left the weight of deciding between life and death. It was, however, a weight more apparent than real, for the question resolved itself into one of two degrees of guilt, and the first was already, inferentially at least, excluded by the agreement of counsel that the prisoner should plead guilty because of his peculiar mental condition.

A portion of this, the fourth day of the trial, was spent in the introduction of evidence relative to Kelley's infancy and youth, corroborating the statements made in the opening of the defense and adding to their force by fuller details. It appeared that he had been a normal child up to four years of age, when the accident occurred resulting in an injury to the brain. As already stated, the seat of this injury is distinctly visible as a depression in the left frontal bone. After the accident there were epileptic convulsions up to 13 or 14 years of age. There was accompanying moral perversion and strange conduct noticeable enough to lead to his being called "foolish Joe," "Kelley's fool," and so on.

He stole persistently, unblushingly and openly. His father said in his testimony: "Beat all boys I ever see; would steal money wherever he see it." He shot himself, as stated by the doctor who treated him, simply to create a sensation. He ran off and wandered away from home on numerous occasions.

Altogether he was a troublesome, erratic boy, and finally after his arrest for larceny his father got a doctor to examine his head to see what was the matter with him, and the doctor told him it would not hurt him to go to the reformatory. He was always good-natured and got along well with people. At the jail, after the murder, when the father saw him he appeared just as he always had. He claimed as a boy to have seen the devil in his room, and there was a place in the wall where the plastering was broken in his attempts to strike the devil.

The mother testified that he thought the devil was after him when he was about twelve years of age. Both mother and sister told him the stealing was wrong, and the sister told him to pray, which he did, but he could not help the stealing. The mother, sister and brother testified to his walking in his sleep. Another sister testified that he drew well, and she asked him to draw houses, but he would always make pictures of the devil in red clothes with a five-tined fork held up in the air.

The doctor who attended him when he shot himself in the arm at the age of sixteen said in his testimony: "From his look and manners he seemed to me unsound. I thought he was regarded below par. He seemed exalted then. He appears very much the same now as then."

Testimony was presented which showed that during the year before the murder, Kelley had undertaken schemes which were of a more ambitious and erratic character than at any previous time. He started a summer hotel on less than three hundred dollars, which was largely stolen money deposited in the savings bank. This enterprise failed. He talked about starting a newspaper and evidently had a serious intention of doing so. An erratic undertaking was an advertising scheme by means of a megaphone, through which he cried various merchants' wares from the top of a building.

These references to the evidence presented by the defense are sufficient as illustrations of its general tenor, and help us very materially to understand Kelley's mental status.

MEDICAL TESTIMONY.

The medical testimony was presented at the close of the direct evidence for the defense. It was arranged that all of the six

experts should be called in succession, the first three being those for the defense. Those who have had occasion to testify under the ordinary conditions with a jury gazing in twelve different directions with a fixed, puzzled and stony stare, and opposing counsel intent on developing two diametrically opposite points of view, will readily perceive that the present situation was a far different one. The jury was pleasantly conspicuous by its absence. The counsel were sitting harmoniously side by side, and the experts could address themselves to the judge freely and in extenso, the hypothetical question, that most misleading and inadequate of forensic makeshifts, being allowed for once to slumber in silence. The pleasure and satisfaction of being able to try at least to say directly and simply on the witness-stand to an intelligent court just what one thought, it is hard to describe in words.

Dr. Charles P. Bancroft, the first expert for the defense, said that in his opinion Kelley's mental condition was one of arrested development due to an injury received upon his head in childhood. He thought the evidence showed that the prisoner was born healthy and continued a normal child until the day he met with the accident. That at that time he received such an injury to the brain as resulted in an improper, or rather prevented the subsequent normal development of the brain cells, and that there had been a consequent and corresponding failure in normal mental growth. He was a child in intellect and moral characteristics. He had many of the impulses and instincts of the adult, but his judgment for the carrying out of these plans was that of a mere child. His moral was more deficient than his intellectual capacity. Moral perversion was one of the earliest symptoms noticed. Next to the epileptiform attacks it was the striking characteristic of his early life and the one feature that made his management problematical. Next to moral obtuseness the most remarkable characteristic was a defective judgment, an inability to compare things properly, to discern the fitness of things, all of which suggests a general all-round deficiency of the higher intellectual processes. Coupled with this intellectual incapacity was an abnormal egoism, and an impulsiveness such as is characteristic of earliest childhood. Kelley never seemed capable of profiting by experience. This inability to exercise healthy judgment, to profit by the second sober thought, to make nice moral distinctions, and this rash impulsiveness that led him to childishly undertake the most absurd schemes that captivated his fancy, all indicate a generally arrested development of mind such as we understand is included in the term imbecility. The case would seem to be one of acquired or traumatic imbecility. Although an imbecile, he was by no means dull or stupid.

His perceptive faculties were unusually bright. But this brightness is evanescent rather than continuous. Back of and underlying this superficial elasticity of mind is the deficiency of judgment already referred to, the inability to maintain continuous exercise of the attention so essential to success anywhere, and a moral obtuseness which at one moment leads him to maintain a virtuous ideal and at the next to indulge in some moral excess.

Dr. Thomas Waterman, the second expert to be called, testified that he thought Kelley's responsibility very largely diminished, but whether absolutely or not he was not quite certain, but thought he would know in time. He regarded him as a case of arrested or defective brain development, and thought the expression that Dr. Bancroft had used, "high-grade imbecile," was expressive of his condition. He was exhilarated to a certain extent, and perhaps had an uncontrollable impulse to rob the bank and kill the cashier, or the killing of the cashier may have been incidental. "Question. He was not of sound mind at that time? Answer. He was not of sound mind; his responsibility was very largely diminished, and perhaps entirely so. I can't feel absolutely certain about his entire responsibility. Q. Could he form a deliberate and premeditated purpose as you would form? A. No, certainly not in that way. He doesn't have the judgment." On cross-examination witness said he thought the crime was probably the product of a diseased mind. Being asked to explain what he meant by probably, he replied that he said "probably" because in such a case he would want to observe it for months.

Dr. Wm. A. Gorton, the third expert for the defense, testified that he regarded Kelley of limited mental development, due probably to the injury of the brain received when he was a child. His condition on the day of the murder was the same that it had been for several years, and he is at present in a state of mental unsoundness. His trouble is not curable. It is a so-called degenerative trouble which is almost certain to go from bad to worse, showing more and more apparent evidence of mental degeneration. He did not have the capacity to carry a deliberate and premeditated purpose into effect as a sane person would have done. He did not have the capacity to resist an impulse in any sane sense. On cross-examination Dr. Gorton said that the first thing you would look for in a feigner would be any manifestation of insanity of an ordinary type. One of the things a feigner always does is to feign some well recognized form of insanity: to be stupid, or maniacal, or to go about and refuse to say anything. In Kelley all that was entirely absent. "I talked to him as I would to any one else about the crime. He gave a full account of it without any hesitation whatever, concealing nothing, as far as I could find out, which bore on his responsibility for it. My own experience with feigners has been that when they feigned a delusion it was for the purpose of excusing them from a crime which they had committed, and they have sought to throw the responsibility upon the delusion instead of on themselves. In this case the picture was exactly

reversed. The prisoner claimed that the devil, under whose guidance he had been, had absolutely nothing to do with this crime; that he alone was responsible." Dr. Gorton further testified that the prisoner did not have complete aberration of the mind, but arrest of mental development, an all-round arrest of development, and while he has left in him various impulses to do wrong and a certain amount of capacity to plan wrongful acts and conceal them, he has not the judgment and moral perception which would enable a person of sound mind to restrain them if the impulse to do them was once conceived.

The first expert for the prosecution was Dr. Edward Cowles. He was called immediately after Dr. Gorton. He testified that Kelley was the subject of limited responsibility. This was explained or described by the fact of his having an imperfect mental development; an imperfect development of a few parts of his mind. That he had epilepsy from five to fourteen is sufficient to account for a certain degree of the mental degeneration that appears in the ordinary observation of the man as he is seen here. The injury to the head probably accounts for the epilepsy. Some parts of his mind did go on to develop from the age of four through his youth, and in some degree perhaps most parts, but not all. The parts of a man's mind in which the defect appears can be explained in this way: he must have some perception of things going on around him; he must have memory; he must then have the power to reason and form judgments about what he remembers, and then he should have control of these—complete, effective normal control of his mental operations; then he should have normal development of the moral sense of right and wrong. In this case the prisoner has quick perception, he is alert and bright; he sees what is going on around him, perhaps to a greater degree than the average man. He has a good memory, but he lacks the essential power of control. He does form judgments, and of course has notions of things, and he does reason. But when he comes to motives his moral sense is decidedly defective and limited. . . . He does have natural affections and some feeling of regard for others, but that is imperfect and does not control his conduct. When he comes to act he acts upon his desires and impulses very largely, though with some reasoning about it. . . . He is gentle and amiable, . . . and he does not have the vicious traits that give him the desires and impulses to do very wrong things. . . . Because he is a person of rather good traits of character primarily, his impulses have not led him to some of the conduct that would put him out of relation with people about him. . . . From his impulse to petty thieving as a child, and in other ways, he has developed a good deal of sharpness and brightness for carrying out his ideas, which carry him through by his appearance on the surface. His thefts and his schemes for getting money have become larger as he has grown older, but he has shown his defect in not having the capacity to plan well and in not controlling his ideas sufficiently to form good judgments. The premeditating to do this deed first as a theft and then with a final impulse to commit the crime is a natural outcome of the

rather complicated condition already described. And the crime itself being so foreign to his general character and the quality of his mind, it is indisputably an evidence of want of reason and capacity to plan and conceive such a thing. His responsibility is limited in that way, rather than limited by what would be technically called insanity. It is more a limitation of responsibility that characterizes the criminal than an insane person, but in attempting to draw the line the difficulty arises that there is in the background the condition of disease which we have to consider: his epilepsy which has affected his nervous organization has given him an imperfect development and the crime has resulted.

Dr. George F. Jelly testified that he considered Kelley childish and erratic, though possessed of a great deal of mental acuteness. His moral perceptions are blunted; his ability to control his desires and impulses is blunted. . . . The case is one of limited responsibility on account of impaired mental development, which prevents him from exercising the power of premeditation and of deliberation. To that degree he is irresponsible. "I have been much impressed," said Dr. Jelly, "in watching him here, to notice his lack of reserve. I sat by him during most of the trial and was struck very much by the lack of concern which he showed after having plead guilty to the charge of murder, sitting drawing pictures, making careless and cheerful comments; and also last night when he shed tears, not because of his situation, but because he thought we had slighted him in regard to his poetry. He seemed more impressed by that fact—that we thought lightly of his poetry—than that he was accused of murder, or the fact that he had confessed murder and was liable to hang. These things are in line with impaired mental development and with that diminished responsibility which I believe exists in this case."

The writer was the last of the six experts called. He went over somewhat the same ground as those who had preceded him, and said he thought there was a defect in Kelley's brain which had resulted in mental instability and weakened power of resistance. His responsibility was limited as a result of the brain impairment. He thought there would be progressive degeneration and eventually complete mental break-down. He did not think that he possessed the capacity to form a premeditated and deliberate purpose to the degree that a sane man would.

This closed all the testimony in the case. The court established the degree of murder as that of the second degree, this being in New Hampshire a thirty years' sentence to the State prison, and the trial was at an end.

In seeking to make a diagnosis of Kelley's condition the conclusion is forced upon one that he belongs to the great class of degenerates. The physical signs presented by themselves somewhat aptly correspond to what we should expect to find in a big,

healthy boy. There are few anomalies, or what could be correctly called stigmata, unless we class facial expression as showing itself in muscular co-ordination as physical. *There is a lack of development to some extent physically in proportion to age.* The body has not outgrown the early teens. It has not matured fast enough. There are, however, no marked asymmetries or departures from the average. The physical signs are negative rather than positive, yet taken in connection with the mental stigmata have as much value as if they were more striking and obvious. *An undeveloped type may have as great a significance as an over-developed or an anomalous type.* As Hirsch¹ has well said: "In consequence of the disturbances of development in degeneracy, the quintessence of the malady is to be sought in the disproportion in which the mental factors stand to one another." So it may be said of the physical factors, which must be taken into consideration in connection with the mental. While alone they may have only a doubtful value, combined with the mental they may serve to bring out or to accentuate details which together go to make up the picture of degeneracy.

The mental stigmata in Kelley's case were obvious and striking, yet the physical signs helped to make clearer the disproportion in which the mental factors stood to each other, and so filled in and completed the picture.

Hirsch quotes Morel as dividing degenerates into four classes, the first embracing persons in whom there are no particular anomalies, but who are characterized by a so-called nervous temperament. The second class includes those persons who, while their intellectual powers are unimpaired, display a decided disturbance of their feelings and impulses, and consequently great defects and perversity in morals. The third class contains imbeciles whose mental weakness is limited to the intellect, so that the instincts hold sway over the understanding; and the fourth class, idiots, in whom the whole mental development is extremely low. Hirsch very properly calls attention to the fact that any classification is largely arbitrary, as one class imperceptibly shades into another, still such an attempt is of assistance in defining our ideas in a case like Kelley's. He approximates to the second class, though we could not say his intellectual

¹ Genius and Degeneration, by Wm. Hirsch, p. 122.

powers were wholly unimpaired. We would, however, say that the greatest disproportion existed between the intellectual and moral factors, that there was a decided disturbance of the feelings and impulses, and great defects and perversity of morals.

In conclusion attention may be directed to various points of medico-legal interest suggested by this case, a discussion of which would be quite beyond the scope of this paper. 1. The value of an examination of a criminal to determine his mental condition in the presence of a large number of persons is doubtful and uncertain, and may not in itself be sufficient to accomplish the desired object. 2. Each expert should be allowed to examine the prisoner alone. 3. In a medico-legal case the time of the trial should be extended until the experts have had every opportunity to form an opinion. 4. It would further the ends of justice and save expense to the State if the experts of both sides could have a conference before the trial, in order that they might come to some mutual understanding or formulate a joint opinion. 5. A conference being out of the question before the trial, a conference during the trial would be the next best thing. 6. It would add to the dignity of testifying in court if experts would at least endeavor to pursue such a course. 7. The best way for the expert to express his opinion is directly to the court. The clearness, directness and reliability of his testimony are largely enhanced by this means. 8. The hypothetical question is admirably calculated to befuddle juries; it stimulates hair-splitting on the part of counsel, and obliges doctors to make fools of themselves. The truth of this statement was abundantly proved in the present case, where, there being no hypothetical question, the expert was able to leave the witness-stand feeling that he still had some self-respect remaining and had not unwittingly stultified himself in giving his opinion. 9. A more searching inquiry into the subject of degeneracy and the mental status of degenerates is desirable. 10. Should experts define responsibility? Can they say in court a man is partly responsible? Would it be better in testifying not to attempt to draw a line between degrees of responsibility? Medically and informally the writer sees no objection to doing so. In the case at issue the prisoner was not apparently the subject of a specific form of insanity, yet he was deficient mentally and to a degree which interfered with his

complete responsibility. Did he have mental capacity enough to exercise in a sane sense the powers of deliberation and premeditation? was the question the court asked each expert. If not, he could not be responsible. But is a man who is not responsible a sane man? Fortunately these questions were not discussed, and the punishment was justly made to fit the degree of responsibility.



PLATE I.

To face page 414.



LONGITUDINAL DIÁMETER.

TRANSVERSE DIAMETER.

HORIZONTAL CIRCUMFERENCE.

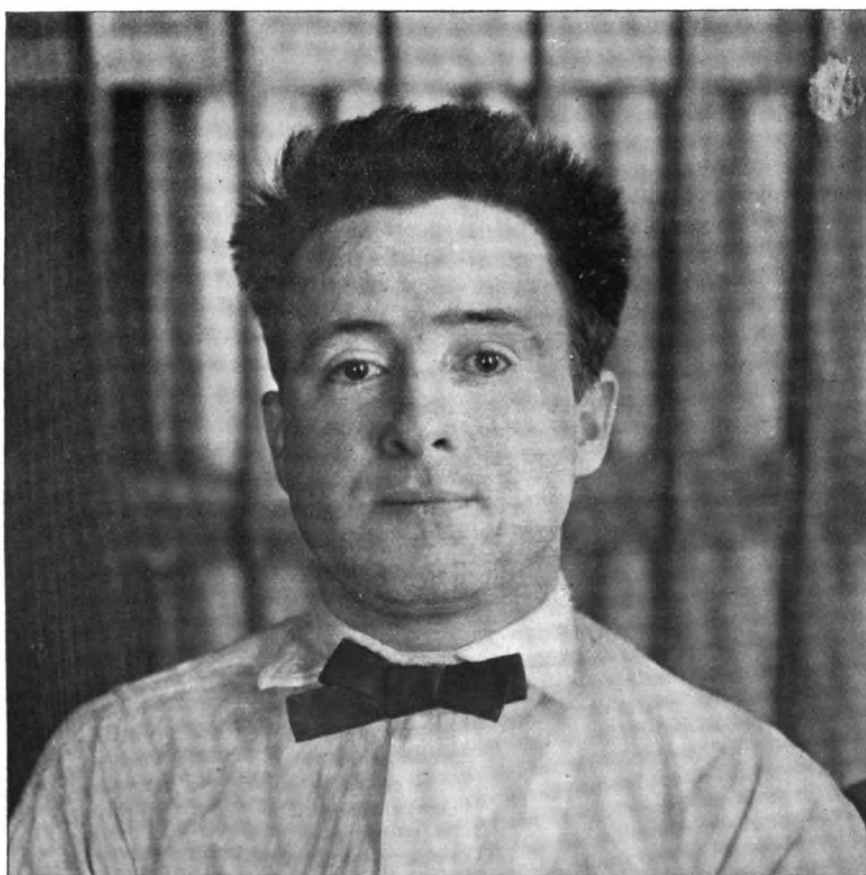


PLATE III.—PHOTOGRAPH OF KELLEY.

To follow Plate II, page 414.

ON MYXŒDEMA-LIKE CONDITIONS IN THE NEGRO.

By HENRY J. BERKLEY, M. D.,
The Johns Hopkins University.

During the winter of 1897, in selecting the material among the idiots and half-idiots in the city asylum and adjacent almshouse for the class in psychiatry, I found a small number of atypical cases of sporadic cretinism among the white inmates, and among the blacks two or three cases of a peculiar thickening of local portions of the integument, strongly resembling myxœdematous swellings. As myxœdema in the negro race is at present an unknown malady, and universally denied, we concluded to make a further investigation of the entire population of about sixteen hundred souls in the two institutions, which included between three and four hundred negroes, a majority of these being mentally deficient. The search did not result in the discovery of more cases of cretinism among the whites, but in the addition to our stock of several cases of the local myxœdematous swelling in the blacks. To this material was subsequently added two further cases, one by the admission of a negro imbecile boy to the asylum; the other case was found in the city, a woman of middle age, who had had the tumefaction since childhood. These last two cases were under observation so short a time that it was impracticable to do more than make the diagnosis, but the examination given disclosed no marked variation from the more closely studied ones. Accordingly, we had, at command, a total of eight cases of a peculiar thickening, local in character, of the skin, in the black race, identical in all respects with that present in cases of sporadic cretinism in the Caucasian race, but less diffuse in character. Four examples were discovered among the idiots, one in a case of paretic dementia in the third stage, one in a case of acute mania, one in a demented patient whose antecedent history could not be obtained, and one in an individual who

exhibited no mental change beyond extreme slowness. With a single exception, an idiot girl, who might be placed more directly under the cretin type, the other cases showed the skin thickening very locally, and then only about the integument of the scalp and neck.

We have, therefore, a pathological condition differing considerably in its purely local characteristics from the ordinary diffuse myxoedematous swelling of the skin in sporadic cretinism, or from the myxoedema acquired from thyroid changes in later life, yet presenting perfectly the local characteristics of the malady; something I have found no description of in either text-book or journal article, and especially interesting from the standpoint of the denial of the occurrence of myxoedema in the negro race.

A general examination showed departures from the normal in the thyroid gland always to be present; in seven cases it was either not palpable or below the normal in size; in one it was enlarged. The hair showed alterations in two cases, being coarse, thin and rough. The bones were abnormally broad in only one case, the idiot approaching a cretinoid state, but even in this individual there seemed to be no defect in the growth lengthwise, the subject being quite up to the average in height. While the development of the skull showed many changes and departures from the normal in the growth of the bones, the region of the fontanelles had no abnormalities to be observed.

The secretions of the skin did not appear to be altered from the normal, and even over the myxoedematous areas there was little of the dryness and roughness, usually one of the principal characteristics of the disease. Where there was local tumefaction of the skin, the folds of the integument were obliterated.

The local swellings presented to the hand a firm, inelastic feel, as if jelly had been forced under the skin. There was not a trace of pitting on firm pressure, but a quick rebound when the pressure was removed.

Changes in the general bulk of the body were confined to two cases, and only with these exceptions were the features broadened or coarsened. Pendulousness of the abdomen was only marked in one example.

In the majority of the cases, slowness of thought and action could not be judged by the usual standards, but in the single case seen in the city it was notably present.

Trophic lesions and enlargement of the lymphatics were not found. An unusual fetor was only present in one case.

INDIVIDUAL CASES.

Case I.—Rebecca G., aet. 21, microcephalic type of idiocy, born in Baltimore. Height 165 cm., is well developed.

There is no family or previous history obtainable. Present examination March, 1897.

Is able to talk, and has considerable powers of attention. Has an occasional epileptic attack. Is neat and cleanly.

The skull is dolichocephalic and trigonocephalic, the circumference 48.5 cm., the cephalic index 76.2, the measurement over arch 31 cm., over antero-posterior diameter 31 cm.

The special senses are normal. The accommodative and light reflexes quick in responding to stimuli, while the consensual is slow. The deep reflexes are above par, the superficial normal.

There are no paralyses, defects in the vaso-motor condition, nor associated movement. The skin shows swellings of a firm jelly-like character over scalp, malar bones, and in less degrees about the legs; elsewhere it seems natural. The hair is coarse but not scant. The lips are slightly pendulous.

There is a slight degree of arterio-sclerosis. The thyroid gland is not palpable. Circumference of neck 31.1 cm. There is no exophthalmos. Heart sounds normal. The palate is flat, and there is a well marked torus palatinus. The teeth are regular and not decayed.

The long bones, especially those of the legs and forearms, are very broad. The muscular development is good.

The urinary analysis showed a deficiency in the amount of urea, chlorides and phosphates, but no albumen or sugar.

September, 1897. The swelling of the scalp is not so marked as in the spring, but that of the face has rather increased.

Case II.—Carrie A., congenital idiot, aet. 20, birthplace Virginia. Height 166 cm. No family history obtainable.

Vocabulary very limited. Attention fugacious. Is untidy in her habits.

Skull dolichocephalic, scaphocephalic. Frontal regions ill-developed. Circumference of skull 52 cm. Cephalic index 68.4. Measurement over arch 32 cm., over antero-posterior diameter

36 cm. The reflexes of all kinds are normal. In the right eye there is a staphyloma. There are no paralyses. Condition of arteries normal; the vaso-motor state fair. The bodily development is good, the bones are not broadened. The thyroid gland is very small. Circumference of neck 33 cm. The palate is low arched, and the teeth are defective. There is no exophthalmos.

The deposits of myxœdematous character are located in the scalp and forehead, and are very small.

Urinary analysis showed the phosphates decreased, urea and chlorides normal. No albumen.

Case III.—Eliza D., aet. 36, admitted to asylum in 1895, with general paralysis. Birthplace Maryland. Height 160 cm.

The general family history is good. All her brothers are mentally healthy. Has had one child, and no miscarriages. Acquired syphilis five years previous to admission. One aunt has been insane. There were well marked delusions of grandeur before patient became demented. There are now only occasional attacks of excitement. The skull is dolichocephalic, regular. The cephalic index is 76, the circumference 53 cm. The measurement over arch 36 cm., over antero-posterior diameter 36 cm. Eyesight is normal. Accommodation and consensual reflex are defective. Gustatory sensations defective. The deep and superficial reflexes are exaggerated. The gait is shambling. The vaso-motor state is poor. There is slight arterio-sclerosis. The skin, except over scalp, is normal; there it is much thickened, and boggy to the touch. The muscular development is fair; the long bones are normal for the height. The palate is flat, and the teeth of the upper jaw have entirely disappeared.

The thyroid is small, hardly palpable. The circumference of the neck is 31.5 cm. There is no exophthalmos.

Urinalysis showed decrease of the phosphates and chlorides, otherwise normal.

Case IV.—Kate S., dementia following chronic excitement. Forty-six years of age. Birthplace Maryland. Height 151 cm. History entirely unknown. There is considerable mental enfeeblement, and the attention is fugacious. Is untidy.

The skull is dolichocephalic, scaphocephalic. The cephalic index 72.8, the circumference 49 cm. Measurement over arch 32 cm. Over antero-posterior diameter 32. The special senses

and eye reflexes are normal, together with the deep and superficial reflexes. There is slight arterio-sclerosis. The physical development is fair. The palate is high arched; the teeth are normal.

The thyroid gland is small, the circumference of the neck 30.5 cm. The myxœdematous deposits are confined to the scalp.

Urinalysis showed the phosphates to be very much decreased, urea and chlorides normal. There is a trace of skatol.

Case V.—Mary P., aet. 40. No family history, and is very refractory.

Patient is greatly demented and untidy. The mental reduction followed chronic mania.

The skull is dolichocephalic, scaphocephalic. Cephalic index 76, circumference 51 cm. The special senses, eye reflexes and deep reflexes, as well as could be ascertained, were normal. The skin is natural, except over scalp, where there are hard, jelly-like deposits. The thyroid gland is very small. Circumference of neck 33 cm. The palate is low arched. The long bones are natural in proportion to the height of the individual. The teeth are good.

The urine showed deficiency of phosphates and urea. Trace of skatol.

Case VI.—Emma W., admitted for simple mania. Age 38. Height 169 cm.

Father died of dropsy, the mother of lung trouble. Was one of a family of fourteen children. Has had several living children, but no miscarriages. Is a beer drinker. After recovery from the maniacal attack there was no marked mental reduction. The menopause is about to commence. There have been no previous attacks of insanity.

The shape of the skull is dolichocephalic, regular. The cephalic index is 75.7. The cranial circumference is 56 cm. Measurements over arch and antero-posterior curves are 30 and 33.5 cm. respectively. There is nothing to note about the special senses, reflexes or physical development, or the osseous system.

There is a rich layer of fat over the whole body, and about the face, scalp and neck are diffuse boggy thickenings with the usual jelly-like feel. The arteries are normal. The thyroid gland is considerably hypertrophied. The circumference of the neck is

36 cm. The hair is very coarse. The palate is natural. The urinalysis showed no departure from the normal.

Case VII.—James S., born in Maryland, seventeen years of age. Is the youngest of a family of eight. The father is an alcoholic. None of the other children are mentally deficient. Is half-idiotic. Admitted to asylum April 26, suffering from an attack of acute mania. Has myxœdematous deposits about the scalp. Thyroid not palpable. Was removed by friends next morning before a complete examination could be made.

Case VIII.—Martha S., aet. 38, cook. Born in Virginia. Has over the whole body an abundant layer of fat. About the face and scalp are extensive jelly-like deposits, and here the skin is much thickened. Hair is inclined to be thin. Is very slow in action and thought; is not intelligent. Thyroid palpable, but small. Gives a history of having had the deposits since childhood.

During March, April and May the first five cases were kept under close observation (the sixth having recovered from the attack of mania, was discharged), and frequent urinary and blood examinations were made. The myxœdematous swellings in all of the cases neither decreased nor increased. A consensus of the urinary examinations during this time of Case I. showed:

Average specific gravity 1011. Urine always pale. Acid in reaction, no albumen or sugar. Urea 15 g. to liter. Phosphates normal.

Case II. showed:

Average sp. gr. 1007. Urine pale, acid in reaction. No albumen or sugar. No casts. Urea 12 g. to liter. Phosphates below normal.

Case III. showed:

Average sp. gr. 1012. Reaction acid, pale in color. No albumen or sugar. No casts. Urea 10 g. to liter. Phosphates below normal.

Case IV. showed:

Average sp. gr. 1011, straw color; no albumen, sugar or casts. Urea 15 g. to liter. Phosphates below normal.

Case V. showed:

Average sp. gr. 1013. Color yellow. Acid in reaction, no sugar, albumen or casts. Urea 10 g. per liter. Phosphates varying, sometimes below, sometimes normal.

A blood examination on April 15 gave the following results:

Case I Hemoglobin (Gower's Hemoglobinometer)	92%	Red corpuscles	3,652,000
Case II " "	90%	" "	3,337,150
Case III " "	97%	" "	4,110,000
Case IV " "	98%	" "	4,132,500

Case V. became totally unmanageable and had to be abandoned.

On May 22, the diet remaining the ordinary house diet, Case I. showed 4,879,680 erythrocytes, and the differential count, polynuclears 68.39 per cent.; lymphocytes, the small ones largely predominating, 23.26 per cent.; eosinophiles 6.28 per cent., transitionals 1.28 per cent. A very few red cells were below the normal in size. No nucleated red corpuscles were found.

Case II. gave erythrocytes 4,800,000 per cm., and the differential count, polynuclears 50.09 per cent.; lymphocytes, the small ones predominating in the proportion of 6 to 1 of the large, 39.16 per cent.; transitionals 2.15 per cent., eosinophiles 8.25 per cent., and myelocytes 60.35 per cent. There were no departures in the form of the red cells.

Case III. gave erythrocytes 4,854,000 per cm., and the differential count showed polynuclears 73.01 per cent.; lymphocytes, the small ones predominating in the proportion of 4 to 1, 19.79 per cent.; eosinophiles 5.54 per cent., transitionals 1.35 per cent.; the red cells showed no departures from the normal.

Case IV. gave erythrocytes 4,998,000, and the white differential count, polynuclears 44.24 per cent., lymphocytes 52.88 per cent., the small elements predominating in the proportion of 8 to 1; transitionals 1.02 per cent., and eosinophiles 1.86 per cent. The red corpuscles were perfectly normal. The urinary examinations did not differ essentially from those previously made.

In order to determine, if possible, whether the deposits about the scalp and neck of our cases were truly of a myxoedematous nature, it was determined to place the four manageable cases on some preparation of the thyroid gland. The preparation of Fairchild Bros. was chosen, as being freer from products of decomposition than any of the others, and on June 2 they were all placed on a single daily tablet of the desiccated gland. Previously notes on their general condition, temperature, pulse, respiration were made, and thereafter, throughout the course of the treat-

ment continued twice daily. The treatment lasted from June 2 to July 10, when it was discontinued. At the end of the fifth day two tablets were given, on the tenth day three were administered, and after the nineteenth day, with the exception of Case III., all received four tablets per diem.

Summarized, the results read as follows:

Case I. On June 2 the general condition of the patient is excellent. Tem. 98.5°, P. 80, R. 22. The next morning T. was 98°, P. 90, R. 24. At the end of the second day the T. had risen to 99°, and thereafter fluctuated between 98.5° and 99.2°, until four tablets were administered, when there was a descent for four days to 97.8°, and afterwards a normal temperature to the end of the treatment. During the administration of the three daily tablets the pulse varied between 68 and 82; when four tablets were given it rose to 96 beats, and then slowly declined with a maximum variation between morning and evening of 10 beats. The R. ran unevenly throughout the treatment, varying from 20 to 28, the maximum being reached on the administration of the fourth tablet.

After the thyroid had been administered five days a change was noticed in the mental disposition of the patient. She became brighter, more than usually cheerful, and moved about more than was customary. About the eleventh day the face was noticed to be a little puffy, and so continued until the end of the thyroid administration. The facial swelling never, though, acquired the consistency of the deposits in the scalp. On the eighteenth day the patient exhibited considerable mental and motor excitement, though not sufficient to cause the withdrawal of the drug.

June 22 a blood examination gave the following results:

		Differential Count.	
Red corpuscles	4,976,000	Polymorphonuclears.....	68.15%
White "	8,140	Large mononuclears.....	6.60%
Hemoglobin	95%	Small "	18.32%
		Transitionals	3.96%
		Eosinophiles	2.79%

The urine at this date gave the accompanying reactions: Color, straw; sp. gr., 1.013, acid; urea, 9 g. to liter. Albumen and sugar none. Phosphates earthy and alkaline normal. Chlorides normal. On July 5 the sp. gr. had risen (diet remaining the

same) to 1018, urea to 12 g. per liter, the alkaline phosphates had diminished, while the other constituents remained unchanged. On July 10 the urea had increased to 20 g. per liter. The cutaneous transpiration is increased, owing, probably, to the warmer weather. The myxœdematous condition about the scalp had by this date perceptibly decreased, so much so, indeed, that great folds of the scalp-skin appeared when the skin was slightly compressed between the fingers, a condition that could not be obtained before the thyroid administration. (Fig. 1.)

Case II. When thyroid administration was first begun the physical condition of this patient was excellent. T. 98°, P. 80, R. 18. Like Case I., the temperature and respiration at first sank, the one to 97°, the other to 70 beats, while the R. rose very slightly. Thereafter the T. rose slightly, averaging 98.4°, and only after the dose was increased to four tablets daily did it reach 99°. The pulse averaged 90 beats until July 5, when it sank to 70. The R. showed some peculiar characteristics, sinking on July 1 to 11 in the morning and rising to 26 in the afternoon; the average change being 17 morning, 22 in the evening.

By the eighth day of the administration the mental characteristics of the patient altered slightly; she became more lively, but had no well marked excitement. The myxœdematous deposits on July 10 are slightly altered in volume. The secretion of the skin increased.

The blood examination, June 22, gave:

				Differential Count.	
Red corpuscles	4,592,000			Polymorphonuclears	73.10%
White "	6,500			Small mononuclears	17.33%
Hemoglobin	95%			Large "	4.65%
				Transitionals	2.46%
				Eosinophiles	2.46%

The urinalysis, June 21, gave: Color, pale straw; sp. gr., 1015; acid; urea, 11 g. to liter; chlorides, sulphates and phosphates normal.

On July 3: Color, amber; sp. gr., 1024, acid; urea, 22 g. per liter; chlorides, phosphates and sulphates normal. Sugar and albumen none. On July 10 the quantity of urea was 21 g. per liter.

The condition of the patient after the treatment was completed

rapidly returned to the usual state; indeed the treatment had little apparent effect beyond removing some of the myxœdematous deposit.

Case III. June 2; patient in fair physical condition; T. 97.8°, R. 24, P. 80. For three days after the commencement of the thyroid administration the T. continued to be a little over 99°, and then for four days ran below 98°. After the administration of the second and third tablets daily it passed the 100° line, and continued between 99° and 100° until July 6, when it dropped to 98°. The pulse gradually ascended, reaching its acme on June 12 (100), and then remained steadily between 90 and 100 beats, until July 5, when it dropped to 80 beats. The R. varied between 24 and 30 during the whole period of treatment.

The patient is much reduced mentally, being in the third stage of general paresis, but brightened up very much during the thyroid administration, became talkative, and for the time being was very much improved, and indeed retained some of the gain for several weeks. There was no unusual motor excitement. The boggy myxœdematous scalp greatly lessened in tenseness, and on slight pressure deep folds may be made in the skin of the scalp, a condition that before the administration of the thyroid was impossible to nearly the same degree. (Fig. 11.)

On July 25 the blood examination gave:

Differential Count.			
Red corpuscles	4,212,000	Polynuclears.....	82.42%
White "	10,000	Small mononuclears.....	10.48%
Hemoglobin	90%	Large "	3.60%
		Transitionals	2.18%
		Eosinophiles.....	1.31%

A urinalysis, June 21, gave: Color, straw; sp. gr., 1016; react. neutral; urea, 9 g. to liter; chlorides and sulphates normal; earthy phosphates diminished; alkaline phosphates increased above normal; sugar and albumen none. Calcium oxalate crystals were found during the microscopic examination.

On July 3 the result was: Color, amber; sp. gr., 1009, faintly acid; urea, 8 g. to liter; chlorides and sulphates normal; earthy phosphates diminished; alkaline normal. A trace of indican. The amount of urea on July 10 had increased to 21 g. per liter.

Case IV. Physical condition of this patient at beginning of



FIG. I.—Showing the condition of the scalp after the administration of the thyroid extract.



FIG. II.—Showing the condition of the scalp after the administration of the thyroid extract.

the treatment fair. T. 98.2°, P. 80, R. 20. The T. on the second day increased to 99°, but immediately fell to 97.5° and so remained for some days, but on June 9, after the administration of the second thyroid tablet, rose again to 99.2°, and so remained until after the administration of the third tablet (June 19), when it fell to 97.4°, and remained thereafter between 98° and 99°. The pulse rate followed closely the temperature, reaching its maximum, 100 beats, on the increase to the third and fourth tablet, and decreasing again as soon as the system became accustomed to the drug. The R. varied between 16 and 20, the maximum more often being in the morning than in the evening.

On June 26 the blood count gave:

		Differential Count.	
Red corpuscles	5,492,800	Polymorphonuclears	52.49%
White "	6,500	Small mononuclears	38.06%
Hemoglobin	95%	Large "	6.43%
		Transitionals	2.36%
		Eosinophiles .....	.65%

The urinalysis, June 21, showed: Color, light reddish brown; sp. gr., 1013, faintly acid; urea, 6 g. to liter; chlorides and earthy phosphates normal; alkaline phosphates and sulphates somewhat diminished. Microscopically there were numerous red corpuscles found; a few leucocytes, and vaginal epithelium.

On July 3: Color, pale straw; sp. gr., 1015, acid; urea, 9 g. per liter; chlorides, earthy phosphates and sulphates normal; alkaline phosphates diminished. No red corpuscles were found in this specimen, showing the hemoglobinuria to have been transient. On July 10, urea 10 g. to the liter.

Before the treatment was inaugurated patient was very much demented, quiet, indolent, seldom speaking to any one. During the administration she became much brighter, talked more intelligently, and has remained to the end of September brighter than formerly. The myxoedematous deposits decreased considerably during the treatment, only to return to their former state after its discontinuance.

The results obtained by the administration of the thyroid extract proved fairly conclusively that the jelly-like thickenings of the skin of the superior extremity, in the four cases, was of the same general nature as that in ordinary myxoedema; in other

words, that the effect of the administration of the dried thyroid gland was to remove it, in part, for the time being. It was also rather interesting to note that all these cases improved mentally during the period of administration, and did not return to their customary state until some time after it had been stopped. No ill effects were noticed from the action of the drug during the administration, as so often occurs in cases of ordinary insanity.

In view of the previous blood examinations in myxœdema by Kraepelin, Schmidt, Laache and others, we confidently expected to have more decided results from this part of the study than was actually obtained. Three of the subjects at the beginning of the investigation showed a moderate eosinophilia, which soon disappeared. One had a lymphocytosis of moderate degree. The hemoglobin percentage, however, excites more interest, standing throughout the examinations much higher than one could expect from the diet and unhygienic surroundings of the patients, the latter being entirely due to overcrowding.

Contrary to the observations of Kraepelin upon myxœdema, absolutely no abnormalities were ever discovered in the shape or diameter of the red cells of any of the patients.

The variation in the excretion of urea during the several months the patients were under observation is worthy of notice. In all of the several cases, during March, April and May, the amount was subnormal, averaging in the four most tractable subjects only 13 g. to the liter. During the early part of the thyroid administration it declined to only 8.75 g. per liter; then in the middle portion it rose to 12 g. to the liter, and at the end of the investigation to 18 g. per liter, but where previously all the cases had been below the normal, two now showed a slight excess, one the normal quantity, and one one-half of the normal. On September 23 the urea excretion had again fallen below the normal, now averaging only 8.38 g. to the liter. During the whole course of the investigation the diet of the patients was but slightly varied.

I am exceedingly indebted to Dr. Knapp, the resident at the asylum, and to Mr. Elting, for many of the blood and urinary examinations and for their careful observation of the cases.

THE BREADTH OF THE PSYCHIATRIC SPECIALTY.

By THEO. H. KELLOGG, M. D., NEW YORK.

The object of this paper is not solely and directly to formulate a reply to the critical and sceptic views sometimes expressed, as to alienistic knowledge, by those willing to add a little glory to their own branch of learning by detraction from the science of mental diseases, but rather to briefly turn the search-light of truth on such general facts as best display the full breadth of the psychiatric specialty. The idea that this specialty is narrow tends to obstruct its progress and to prevent such wide medical attainments as are absolutely essential to its successful practice. In its full height and depth psychiatry has only been fully mastered by a few great minds, and thus the unusual extensiveness and difficulties of this science, although readily overcome by systematic study, have served to raise doubts of its very existence in the minds of some legal and medical practitioners and of a few specialists ready to magnify their own narrower calling. What then are the actual facts in the case, and what is the full scope of the general education required in the practical, thorough and skillful psychiatrist?

The alienist must be well grounded in general medicine, not alone to treat intercurrent affections in his patients, but to deal successfully with all those internal diseases which bear such intimate relations to insanity. He must be an adept in their management and fully understand the etiological bearings to mental disorders of sexual, cardiac, gastro-intestinal and pulmonary affections. He must be familiar also as regards insanity with the diagnostic and prognostic significance of specific disease, and of all diathetic, toxic or auto-toxic states. If he have not great general ability as a clinician and therapist he cannot detect or remove the physical causes of mental disease. Even a host of affections known more specially to gynecologists, ophthalmologists and other specialists must not escape his attention. The

competent psychiatrist must possess also both general and special surgical knowledge, not alone to cope with the traumatic psychoses, but to comprehend the general causative relations of surgical affections to insanity and the modes of relief to be had by operative procedures. It is set forth in chapter XI of the writer's "Text-book on Mental Diseases" how important a rôle surgery has to play in psychiatry.

The practitioner of mental diseases must also lay a wide foundation of general anatomical and physiological knowledge. The technical attainment of an adequate acquaintance with the minute anatomy of the nervous system alone is a great labor, as those can well testify who have spent much time and money to learn it abroad, where it was formerly studied to best advantage. Then again the alienist must practically know all the main points of neurological science, in order to diagnose and treat the somatic symptoms of mental disease. In fact neurological and mental disorders are constantly and intimately blended, and are to be recognized and dealt with as parallel affections. The capable psychiatrist in hospital wards daily sees and prescribes for hosts of nervous as well as mental diseases. In fact the pathology of many forms of insanity cannot be determined without much facility in neurological diagnosis. The accomplished alienist must also know much of laboratory work, of microscopical pathology and of medical chemistry, bacteriology and toxicology. He must also possess no small amount of legal lore, and must be especially familiar with the judicial aspects of mental diseases, and statutory regulations as to insanity, and his duties, responsibilities and personal rights as an expert witness before judge and jury. He must determine doubtful cases of testamentary capacity and all forms of modified responsibility of the insane in civil cases brought into court, and in criminal offenses individual reputation and even the issues of life and death may rest upon his decision, which must be reached in accordance with the laws of evidence.

The most technical and special knowledge of the psychiatrist, however, is embraced under the terms psychological and alienistic, and includes all that is known of the science of mind in the one instance, and all that can be learned of the nature and symptoms of mental alienation in the second place.

Psychological studies to be successful must be broad and practical, and must lead to perfect acquaintance with the human mind, and the character and motives of men, women and children in all the walks of life. The science of human life must be familiarly known as well as the science of mind, and this implies an acquaintance with sociology and no mean amount of anthropological knowledge in the psychiatrist treating patients of all nationalities.

The clinical expertness of the physician who has devoted long years to the study of mental diseases is remarkable, and even so incredible as to be denied by some professional men not possessing it. As well might the special expertness of the neurologist, the ophthalmologist, or the gynecologist be called in question. It has even been openly propounded in court that any one with common sense could tell whether a person was sane or insane. So gross is this error that in a doubtful case of insanity to be decided, the opinion of an ignorant nurse having had years of observation in hospitals for the insane would be more reliable than that of the most intelligent professional man without any experience among the insane. In fact, every year of faithful study in psychiatry brings a constant increase in expertness in diagnosis, prognosis and treatment. The infinite variety in types and in the clinical progression of mental diseases renders the specialty practically inexhaustible; and it is not surprising that those who first approach its intricacies should be sceptic, as it is ever the wont of sciolists to be nihilistic in belief, and the greater the ignorance the more hopeless is the state of doubt.

Crude criticisms tending to belittle psychiatry should in no wise discourage the younger members of a specialty which rests on such broad foundations, laid by some of the greatest minds which have adorned medical science. Nor should there be loss of hope, but rather increase of determined ambition from the fact that the specialty demands such breadth of attainments that few countries can boast of more than a score of fully accomplished psychiatrists. A rapid augmentation of this number is soon to be expected from the rising generation of students of mental disorders, who are pressing forward in the oldest and broadest of all specialties.

It might be easy to enlarge this view of the real breadth of

the psychiatric specialty, and to point to the additional requirements of the practicing alienist, to his necessary understanding of general affairs, to his knowledge of hospital construction and management, to his ability to control and direct nurses and employees, and to the personal qualities which contribute to his success among his patients, but the object of these few lines is by no means to present the specialty in the light of laudation. The purpose of this paper will have been attained if by stating actual facts the doubts raised by adverse criticism and the natural difficulties of a trying specialty are in some measure allayed, or if this simple presentation of the real breadth of the specialty shall prove an incentive to renewed efforts on the part of any discouraged or fatigued co-laborer in the wide field of mental science.

PROCEEDINGS OF THE ASSOCIATION OF ASSISTANT PHYSICIANS OF HOSPITALS FOR THE INSANE.

The fifth meeting of the Association of Assistant Physicians of Hospitals for the Insane was held at the Wisconsin State Hospital for the Insane, Mendota, Wisconsin, September 16 and 17, 1897.

The following members were present: A. L. Warner, R. M. Phelps, Emily F. Wells, Viola French, S. F. Mellin, George Boody, George A. Post, Irwin H. Neff, Frank I. Drake.

The following applicants for membership were present: Dr. A. F. Lemke, Prof. W. O. Krohn, and Dr. Samuel Dodds.

FIRST SESSION.—SEPTEMBER 16, 8.45 P. M.

Dr. Geo. A. Post, president, called the meeting to order and introduced Dr. Lyman, superintendent of the Wisconsin State Hospital, who gave an address of welcome, supplementing his address with an account of the Wisconsin method of treating the insane.

The minutes of the fourth meeting of the Association, held at the Eastern Michigan Asylum, Pontiac, Mich., December 3 and 4, 1896, were adopted as printed in the issue of the *AMERICAN JOURNAL OF INSANITY* of January, 1897.

The secretary then made the following report, which was accepted:

"At the last meeting of the Association the attendance was not as anticipated, and with one exception, was local. This apparent drawback has received attention before. In addition to the reasons mentioned at the previous meeting, it should be remembered that this was the second meeting of the year, and this doubtless prevented a representative attendance. Notwithstanding that the attendance at the meetings has not been as hoped for, the interest in the Association has not abated. The one essential point requiring our consideration, namely, how to

secure a larger attendance, is before us and demands solution. Individual work is also essential. It would appear that the adoption of special work, as outlined by one of our members, would extend the interest from meeting to meeting; therefore, if practicable, such work should be assigned. The meeting of the Association twice annually would seem impracticable, and undoubtedly annual meetings would permit of the attendance of more members. It is unnecessary to say that, as heretofore, the Association needs the active work of each member."

The following report of the Treasurer was accepted:

Receipts.—Dues for Membership	\$52 00
Expenditures.—Stationery and books	\$ 95
Telegrams	4 04
Printing programs	7 00
Postage	19 03
Expressage of papers	30
Stenographer's services	22 78
Total	\$54 10—\$54 10
Deficit	\$2 10
Deficit from previous meeting	4 45
Making a total deficit of	\$6 65

The following persons were elected to active membership: Drs. C. D. Morris and C. B. Chapin, of the Eastern Michigan Asylum, Pontiac, Mich.; Prof. W. O. Krohn and Dr. A. F. Lemke, of Illinois Eastern Hospital, Kankakee, Ill.; Dr. Samuel Dodds, Illinois Southern Hospital, Anna, Ill.; Dr. Minerva Newbecker, Nebraska Hospital for the Insane, Lincoln, Neb.; Dr. W. F. Wilson, Home for Feeble-Minded, Faribault, Minn.; Dr. Wm. L. Russell and Dr. Wm. Steinach, Willard State Hospital, Willard, N. Y.; Dr. Anne Burnett, Dr. Charles F. Applegate, and Dr. Alfred T. Gundry, Hospital for the Insane, Clarinda, Iowa.

Elected to honorary membership: Dr. William B. Lyman.

The following officers were elected: President, Dr. Geo. A. Post; vice-president, Dr. George Boody; secretary and treasurer, Dr. Irwin H. Neff. Members of Executive Committee: Geo. A. Post, George Boody, Irwin H. Neff, R. M. Phelps, S. F. Mellin.

The report of the Committee for the assignment of work according to a plan adopted at a previous meeting was accepted, and after discussion, assignment of work was requested.

Motion carried that the president appoint a committee of two for the completion of plan and assignment of work. The president appointed Drs. Neff and Phelps.

Dr. Phelps moved that the meetings be held annually. Motion carried.

The committee appointed to report as to the feasibility of limiting the membership to certain States reported unfavorably. Committee discharged.

Dr. R. M. Phelps read a paper entitled "Imbecility an Element in Insanity." Discussion: Warner, Dodds, Wells, Neff, and Boody.

Dr. George Boody read a paper on "Pure Cocaineism." Discussion: Neff, Warner, Dodds, and Phelps.

Dr. E. F. Wells read a paper by Dr. V. Podstaka, entitled "The Early Diagnosis of Paretic Dementia." Discussion postponed.

Adjournment at 11.30 P. M.

SECOND SESSION.—SEPTEMBER 17, 10.00 A. M.

Discussion of Dr. Podstaka's paper by Neff, Warner, and Phelps.

Prof. W. A. Krohn read a paper entitled "The Relation of Laboratory Psychology to the Study of Insanity." Discussion: Warner, Neff, and Boody.

Dr. A. F. Lemke read a paper entitled "A Report of a Case of Tubercles of Brain, with Some Remarks on Psychical Changes Occasioned by Brain Neoplasm." Discussion: Boody, Phelps, and French.

Dr. S. F. Mellin read a paper entitled "Report of the Ophthalmologist at Willard State Hospital for One Year." Discussion: Boody, Warner, Neff, and French.

Adjournment at 12 M.

THIRD SESSION.—SEPTEMBER 17, 2.00 P. M.

Dr. Irwin H. Neff read a paper on "Staff Meetings in Hospitals for the Insane." Discussion: Mellin, Wells, French, and Phelps.

Dr. R. M. Phelps read a paper on "Classification Based on

Clinical Lines, Combined with a Tabulation of Clinical Data." Discussion: Mellin and Neff.

Dr. Samuel Dodds read a paper entitled "The Advantages of Cottages in the Treatment of Certain Cases." Discussion: Mellin, Neff, Phelps, and Boody.

Dr. George Boody read a paper entitled "Report of an Autopsy," with exhibition of photographs.

Owing to limitation of time, a paper by Dr. Irwin H. Neff, entitled "A Syphilitic Case, with Post-mortem," was read by title.

The selection of a place for the next meeting, to take place during May, 1898, was left to the Executive Committee.

Adjournment at 4.00 P. M.

IRWIN H. NEFF, Secretary.

Medico-Legal Notes

By H. E. ALLISON, M. D.,

Medical Superintendent of Matteawan State Hospital.

MODIFIED RESPONSIBILITY.—A case has recently come before the courts wherein an uneducated deaf mute was accused of crime; being unable to read or write, and having no knowledge of the sign language, he was thus without means of communication with counsel and could plead neither guilty nor not guilty. He could understand very little, and that only through persons who had known him for years. As he was consequently deprived of his legal prerogatives, he could not be tried. The question was raised as to his capacity with reference to a knowledge of right and wrong, and as a result he was declared irresponsible. His intellectual and moral faculties were entirely undeveloped. In the English law a deaf mute is presumed to be an idiot; but, as to any particular case, this presumption may be rebutted. His responsibility may be shown by proving that he has been educated in special schools, that his moral sense has been developed and that he has a knowledge of right and wrong. If these facts are not made to appear in evidence, the presumption stands and he is classed among the insane.

In 1871 a similar procedure was followed in the State of New York. An indictment for murder in the first degree was pending against B.; and the court having inquired into the defendant's sanity, found him to be an uneducated deaf mute and thereupon committed him as a lunatic to a State asylum.

B., at the time of the commission of the crime, was twenty-five years of age and was one of two illegitimate brothers born of a negro mother. He was active and industrious, cheerful when not crossed, but possessed of a quick and violent temper, and, having been reared at the county almshouse, was wholly uneducated.

His mind was in the undeveloped state of young childhood.

Early in life he was bound out to a wealthy farmer, with whom he lived. Becoming enraged at the loan to a neighbor of a yoke of oxen to which he was much attached, he killed his employer by splitting open his head with an axe.

He has now remained in custody for twenty-six years. During the early part of his confinement he was subject to sudden outbursts of anger whenever he fancied he had a grievance. His petulant temper rendered him unreliable, but as time passed he became less ungovernable, and during recent years he has been a very competent teamster about the farm; never trusted alone, but in company with some one who understands him, he is able to perform a full day's work with his team, and is a strong, willing and useful laboring man.

Such cases illustrate what is sometimes termed "modified responsibility," as shown in idiots, imbeciles, deaf mutes and others. Crimes of a less serious nature than homicide are often committed by them, and the degree of responsibility is a question that may properly be determined by a jury. The defendant may be committed with justice, as circumstances require, either to an institution for feeble-minded children; to a custodial home for idiots; to an industrial or to a special school; to prison, or to a hospital for the insane. An honest difference of opinion may arise as to the degree of moral and intellectual development and consequent knowledge of right and wrong possessed by any such individual. Whether he shall be judged by the standard of a child's development or by that of a man's is often a question to be determined by evidence at the trial. The fact that such defectives often possess proclivities for committing unlawful acts may show simply a lack of educational advantages and is not necessarily indicative of ingrained criminal traits. They are governed largely by habit and can easily be trained. When such cases come before the criminal courts they only forcibly illustrate what the medical profession, and especially the alienist, has long advocated, namely, that the status of the individual should be carefully considered in examining every problem of crime.

The personality of the man should weigh largely as a factor in determining what disposition to make of him; whether to commit him to an educational institution, to a reformatory, or to a hospital for the insane. His future liberation should depend

upon his development and advancement along educational lines, intellectual, industrial and moral. It is not just to commit all such offenders to prison for a fixed term of years, nor to send them all to lunatic asylums to remain until recovery takes place, which procedure in the case of imbeciles would practically amount to life imprisonment. They should be held until, in the judgment either of the court or of some competent authority, it is proper to release them. In other words, they should be looked upon as court patients are regarded in England, namely, as "Queen's pleasure" lunatics. In dealing with the defective and the degenerate classes, justice should be tempered with wisdom and mercy.

The medical profession is interested in all matters which concern physical and mental non-development. Where a criminal habit has not become fixed and age will permit, each offender should be placed in an environment best suited for his development; the imbecile in a school for feeble-minded children; the blind and the deaf in special schools; the idiot in a custodial home; while the habitual criminal and the dangerous and homicidal insane should be kept in secure and permanent custody. At the same time there should be secured the greatest personal liberty of the individual consistent with the reasonable safety of society, otherwise our charitable and penal institutions will become vast receptacles, filled with an overflowing population without educational or reformatory influences and destined to increase the evil they seek to remedy.

[The following text is extremely faint and largely illegible due to the quality of the scan. It appears to be a list or a series of entries, possibly related to a historical record or a collection of documents. The text is organized into several columns and rows, with some headings that are difficult to decipher. The content seems to include names, dates, and possibly descriptions of items or events.]

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Notes and Comment

THE RELATION OF THE MENTAL NURSE TO THE NURSING PROFESSION.—Dr. T. Outterson Wood contributes to the *Journal of Mental Science* (July, 1897) a paper upon "The Asylum Trained and Certificated Nurses of the Medico-Psychological Association," showing briefly the results of the nursing reform in Great Britain, and discussing some problems of general interest which are likely sooner or later to need solution by American institutions. The British Association in its relation with this great question of trained nurses, writes Dr. Wood, is "face to face with an unequivocal success." The asylum service need be no longer a matter of concern, but the present conditions suggest three questions: 1st. What is the present position the mental nurses hold among nurses generally? 2d. What steps can be taken to improve their status? 3d. What is the position of the qualifying body for these nurses in relation to the public? In considering these questions Dr. Wood refers to the struggle to secure recognition for the nurses of the Medico-Psychological Association by the general medical and surgical nurses of the Royal British Nurses' Association, and the opposition of the latter to such recognition. This hostility arose in part from the popular conception of a mental nurse (probably justified by the pretensions of occasional discharged and incompetent employees) as possessing but one quality worthy of mention—"courage to tackle a violent lunatic." Dr. Wood refers to the acknowledgment now made by many competent authorities that no "nursing curriculum is more uniform or practical, and no standard of examination is higher." He urges the affiliation of the nurses of the Association with some large general nursing association, and believes it to be the duty of the Medico-Psychological Association to assist those holding their nursing certificates when entering the field of private nursing.

Although it is probable that local differences will hinder for

a long time the development of the nursing service in this country to the state of perfection rendered possible by the more favorable conditions or the necessities of England, anticipation of the ultimate results will materially influence the systematic work of organization, and justifies careful study of the facts set forth by Dr. Wood. The inference is that the only guarantee of success in the management of a training school lies in the broadest conception and treatment of the subject. This was shown in the discussion led by Dr. Wise at the last meeting of the Association, and reported in the July JOURNAL. It has been repeatedly demonstrated that lectures to attendants for the selfish purpose of securing a better ward service do not constitute a school for nurses, that all such tentative and spasmodic efforts have terminated in failure, and that training in mental disorders without a foundation of instruction in bodily nursing will not produce a nurse fit for any service. It has likewise been demonstrated that hospitals for the insane have the material and the opportunity to provide the essential general training whenever they have set aside the bodily sick in separate hospital or infirmary wards under the direction of properly qualified instructors. Graduates from such schools in many instances have entered into successful competition with graduates of general hospitals. It has been further stated by a superintendent of nurses of large experience in both fields that there is great need among general nurses of instruction in the nursing of mental cases, and she suggests the propriety of a course in a hospital for the insane before the certificate of proficiency in nursing is conferred.

The time has come when some general agreement upon a standard of qualifications must be reached, and the best interests of the service require that only the highest ideals and the best results should be sought to be attained. For the accomplishment of this the Association is the most appropriate body.

The benefits to be expected of such action have been summed up by Dr. Cowles:

"There is no one thing that could now be done in regard to them (hospitals for the insane) that will yield so much direct benefit to the patients, profit to the hospitals in furthering their prime purpose of curing the sick, and benefit to the State in promoting the welfare of its citizens by the diffusion among them of

this education, as the establishment of such schools in all such hospitals."

OUT-PATIENT DEPARTMENTS OF MENTAL DISEASES.—The establishment of a Department of Mental Diseases at the Boston Dispensary has been announced, the organization having been completed by the appointment of Dr. Walter Channing in charge of the department, with Dr. Arthur C. Jelly as assistant. "It is believed that the department can be of considerable service to the dispensary physicians and the friends of patients by giving them information in regard to the necessary steps to commit patients to hospitals. It will be the desire of the physicians of the new department to do what may be possible to bring about a more clear and definite recognition of mental diseases before they become fully developed cases of insanity."

The JOURNAL (October, 1893) has noted the establishment of similar departments in connection with the out-patient services at St. Thomas' Hospital, London, and at the Pennsylvania Hospital. In the latter, the "physicians of the Department for the Insane attend for the purpose of giving advice and imparting information to persons who are suffering with supposed premonitory symptoms of mental disease. Many have been cured or relieved by timely aid and saved a prolonged stay in some hospital."

At St. Thomas' Dr. Rayner has been in charge. The service has been an active one, and the need of it has been amply demonstrated. Dr. Rayner believes that not the least of the benefits has been the "medicalization" of incipient cases of insanity, and the reference of the minor ailments of these cases to the various other special departments has aroused the general interest of the staff of the hospital, and has attracted greater attention to the possibilities of treatment.

BERI-BERI AT THE RICHMOND ASYLUM.—The JOURNAL has from time to time during the last few years recorded outbreaks of this distressing disease at the Richmond Asylum, and again notes its increasing severity. In an editorial leader in the *Dublin Daily Independent* of August 4, last, this epidemic and a widely quoted contribution to the *Westminster Review* bearing more or less directly upon it, are discussed as follows:

"The Governors of the Richmond Lunatic Asylum were called together again yesterday for the purpose of considering the congested state of the institution, and the alarming epidemic of Beri-Beri which now exists as a consequence of overcrowding. The report of their proceedings contains no novel information, except that the number of Beri-Beri patients has increased to 150. For months, nay for more than a year, the Governors have discussed the kindred topics of overcrowding and Beri-Beri, but a solution of the difficulty seems to be as remote as ever. We do not blame the Governors in the remotest degree. The only complaint that can be alleged against them is that they have exhibited the most extraordinary patience under very trying circumstances. Patience, however, is a virtue which has its limits, and we candidly think that the utmost limit has been reached. The state of things in Richmond Asylum is as bad as bad could be, and if the Governors are not given a free hand to deal with the crux as they are advised by eminent professional authorities, there is no other course open to them but to throw the responsibility over on the Government Department, the Board of Control, a body which is undoubtedly chiefly responsible for the position of affairs to-day. As our readers know, overcrowding and Beri-Beri in the Richmond Lunatic Asylum are not questions of to-day or yesterday. The facts have been exposed in our columns month after month for a very considerable period. To-day there are in the Asylum 550 patients for whom there is no proper accommodation! Is it any wonder that Beri-Beri, a disease which thrives on overcrowding, has been epidemic almost continuously since 1894? But the Board of Control, who are masters of the situation, will do nothing but obstruct. The Portrane Asylum will not be ready for occupation for five or six years, and even the temporary buildings for the relief of the Richmond Asylum are not making anything like the progress anticipated. In the meantime what is going to happen? The health of the city is endangered by the close proximity of a dirt-disease which it is always difficult to eradicate once it takes a hold. In face of this grave danger the Board of Control will do nothing, and all that the Governors can do is to propose to send a deputation to the Lord Lieutenant to request the temporary use of the Grangegorman Female Prison,

which has been already refused by the Government. If this makeshift fails we really do not see what more the Governors can do except hand over the Asylum, with its 1650 inmates, including 150 Beri-Beri patients, to the Board of Control, who are masters of the people's money without being amenable to public influence.

"The bungling and callous indifference of the Board of Control, the irresponsible body who have charge of Irish Asylums, would go far in itself to justify the outspoken and closely-reasoned article by Mr. W. J. Corbet, M. P., in the current number of the *Westminster Review*, entitled 'Plain Speaking About Lunacy.' Mr. Corbet deals with the increase in the number of inmates of lunatic asylums, and he once again accuses the Lunacy Authorities of attempting to show that the increase is only apparent and not real. Evidently whether the Irish Board of Control regard the increase as apparent or real they are in no particular hurry to adopt measures for coping with it. Mr. Corbet's accusation against lunacy officials—that is, those in supreme control—is that they are content to perform their duties in a merely perfunctory manner, without paying due regard to the interests of the public or facing boldly the problem of the increase of insanity. The member for East Wicklow makes out a strong case against the Lunacy Board of England and Wales—a stronger case, we venture to think, than any which he has made out yet. Taking the official contention that 'there is no material increase in insanity out of proportion to the increase of population,' he proves from the official reports themselves that there has been an actual increase in the numbers of the insane, between 1859 and 1895, far beyond the double, 'while the ratio of the insane to sane has concurrently nearly doubled also.' This being the case, it is hard to give credence to the contention that the increase is due to accumulation consequent on greater longevity in asylums, coupled with a decrease in the recovery rate. It is quite true that asylums are more healthy now than they were in 1859—always excepting the Richmond Lunatic Asylum—but while this fact may account for some of the increase since 1859, it surely cannot account for the 'continuous increase annually,' when we consider that the death-rate in the asylums to-day is not more favorable than it was a decade or two ago. If the official contention as to accumu-

lation were correct, it would almost mean that in these latter days lunatics do not die at all! Mr. Corbet shows conclusively that where the lunacy authorities err is in closing their eyes to the terrible fact of heredity as a factor in the increase of insanity. He quotes authorities to show that heredity is a prime cause of insanity, and he discusses, without offering an opinion of his own, the suggested remedy for an evil which is filling our asylums to overflowing, and to which the responsible authorities will not open their eyes. Of this there can be no doubt whatever that Mr. Corbet, M. P., has made out a clear case for the appointment of an International Commission of Inquiry into a subject which, as we know to our cost here in Dublin, is becoming more pressing and important every day. The state of things in Dublin is not an isolated instance of the increase of insanity entirely out of proportion to the increase of population, though it affords a very forcible argument in support of Mr. Corbet's general proposition. Insanity has increased in Ireland, while the population has decreased. It would be interesting to find out how the partisans of the theory that the increase is apparent and not real reconcile this undoubted fact with their pet idea—an idea which Mr. Corbet, more than any other man, has most vigorously and effectively attacked."

THE DISCOVERIES OF PROF. ELMER GATES.—Many of our readers have doubtless seen statements in the daily papers regarding certain great improvements in the microscope and telescope said to have been made by Prof. Elmer Gates, of Washington. An authoritative statement by the discoverer himself appears in the *Medical Times* of November, 1897. The gist of the discovery lies in substituting for the outer lens, or what the Professor calls the "ocular" of the microscope, another compound microscope, which is focused upon the optical image, thus magnifying it to a much greater extent than is done by the simple lens of the eye-piece. In this way he claims to make details visible which cannot be seen by the ordinary methods. As the illumination of an object so highly magnified is necessarily very feeble, the light from the object being spread over such an immensely greater surface, he resorts to photography, and by the cumulative effect upon the plate of small amounts of light acting through a long time succeeds in photographing such an image, in the same way

that stars may be photographed which are invisible through the telescope used for the purpose.

There would seem to be no optical difficulty in obtaining and photographing such enlargements as are described, but when he claims, as we understand him to do, that by thus using, for instance, a microscope of a magnifying power of 600 diameters, as much additional detail is revealed as is brought out in the first instance by directly viewing the object with a microscope of that power, the statement seems to us to involve serious improbabilities.

It is well known to all microscopists that, although it is easy to enlarge the apparent size of a microscopical object by using higher eye-pieces, beyond a certain limit nothing is gained in the amount of detail that can be seen. The reasons for this, as we understand them, are two. In the first place, any optical defects in the objective blur a small image much more than a large one. If there is any blurring of the outlines, it is actually as great in the case of a small object as of a large one, but proportionally to the size of the image it is greater the smaller the object. If the indistinctness of an object as seen by a given power is due to a lack of sharpness in its outline, magnifying the image will magnify the defect in the same proportion, and therefore will make no improvement in the distinctness with which it is seen. In the second place, with a given lens, objects below a certain size do not, properly speaking, form any image at all. If their different parts are not far enough apart for the light coming from them to be focused at an appreciable distance apart, they are seen, if seen at all, as points, without definite shape. In such a case, magnifying the image would not increase the clearness with which that particular detail can be seen. It would hardly seem likely, therefore, that any results can be obtained commensurate with the amount of work involved in such delicate manipulations.

He also claims to have succeeded, by a new method of section-cutting, in producing sections of about one one-hundredth the thickness of any heretofore made. As he elsewhere states that, by means of the use of light of proper wave-length, he can see a short distance beneath the surface of most opaque objects, and, for instance, see a muscle cell in his finger through the three layers of the skin, this would almost seem superfluous.

When a person makes extraordinary claims which seem, upon their face, improbable, it is natural to inquire what have been his previous achievements. If it appears that he has already succeeded in accomplishing what seemed to be impossible, we are more inclined to give credit to what may seem surprising statements in regard to other matters. Fortunately, we are not left in the dark in that respect in regard to Prof. Gates. We have not discovered from what institution of learning he holds his title, but in an article of thirteen pages in the December number of the same journal he announces a series of discoveries from which it would appear that the improvements with which he expects to revolutionize all the branches of science dependent on the microscope and the telescope are but insignificant episodes in the astounding achievements of his intellect. Space will only allow us to mention briefly some of the more important points.

He has discovered an "art of mentation," by means of which he has been enabled to increase his mental capacity, and to augment the quantity and quality of his originaive work in invention and research. From this have resulted all his other discoveries.

He has discovered and developed six new departments of psychological research, namely, Biologic Psychology, Subjective Biologic Psychology, Sociologic Psychology, Psychologic Biology, Subjective Psychologic Biology, and Sociologic Biology.

He has devised a method of "brain-building," of which he says: "Suffice it to say, the evidence is complete which demonstrates that every mental activity creates a definite chemical change and a definite anatomical structure in the animal which exercises that mental activity, and that this is the *modus operandi* of animal growth and evolution, and that by this method more mind can be embodied *ad libitum*." By this means he can cure immorality by developing a large and dominant number of normal cells in the very areas in which the evilly functioning cells were, and keeping them functionally active for a longer period each day than the evil ones have a chance to be active.

He has established, to his own satisfaction, "that life and vitality and physiologic processes are simply and solely mental processes. . . If we can know how to regulate mind-processes, then we can cure disease—all disease." As he says elsewhere, "Hence this paper may be considered to contain a first statement

of a scientific and fundamental law of cure, to be hereafter elaborated and rendered more definite by a series of most interesting experimental researches."

We will not delay to mention various other discoveries which the author mentions incidentally, any one of which would be enough to immortalize its originator. Enough has already been said to show that if the Professor's statements can be accepted, all the achievements of human genius hitherto sink into utter insignificance in comparison to what he has been able to accomplish by his own unaided powers. To have devised means to produce mind *ad libitum*, to extirpate all immorality and cure all disease are achievements of which it is impossible to speak hyperbolically; the furthest reach of the powers of human expression must fall short of doing justice to the subject.

We can only trust that the Professor will so far apply his discoveries to himself as to preserve his life until the promised volumes on mentation and brain-building are before the public. Then, instead of awaiting the uncertain and sporadic appearance of men of genius, we shall be able to raise geniuses of any desired variety as we now can fatten oxen and swine. When that day arrives, nobody, not even Prof. Elmer Gates, will be indispensable.

SCOTTISH ASYLUMS FROM A SOUTH AMERICAN POINT OF VIEW.—Dr. A. Campbell Clark, of Glasgow, has kindly sent a translation of two interesting letters from Dr. Cabred, Professor of Mental Diseases in the University of Buenos Ayres, and Medical Superintendent of the Public Lunatic Asylum for men, which appeared in the numbers of *La Prensa*, an Argentine newspaper, for 20th and 22d July, 1896:

THE INSANE IN SCOTLAND.

Edinburgh, 8th June, 1896.

This country has had the honor of introducing into the general management of the insane, modifications of such importance as to constitute in their entirety a system to which is justly given the name of Scottish. The advances that have been made in this department of philanthropic administration began in the year 1857, when the wise lunacy law was promulgated which is at present in force, by which the supreme direction and supervision of everything referring to lunacy administration was centralized in a general council of inspectors of the insane. (General

Board of Commissioners in Lunacy.) This centralization of powers has given the best results, and it may be said that the commissioners have taken the initiative in most of the beneficent reforms which have been introduced into the general plans and internal regulations of asylums. These reforms are principally due to the efforts of Drs. Mitchell and Sibbald, two eminent alienists who have devoted about forty years to lunacy affairs. The General Board of Commissioners is composed of five members, of whom two are medical and two legal. There are besides two auxiliary inspectors, also medical, but who take no part in the deliberations of the board.

The treatment and care of the insane is in accordance with two systems, in public and private asylums, and in private houses. (Private Dwellings System.)

There are in the country at the present time twenty-six public establishments for the insane and only five private asylums. There are also several sections of institutions called poorhouses, in which tranquil, incurable, and inoffensive patients are received; and lastly there are two asylums for juvenile idiots, and a special section of the prison at Perth for what are called criminal lunatics. The public asylums are divided into Royal asylums and District and Parochial asylums.

The Royal asylums, seven in number, owe their existence to private donations and subscriptions, and are so called because they possess royal charters which secure their autonomy. The donations are in some cases so large as to suffice by themselves to establish an asylum, in which case, as in that of the Crichton Institution, the asylum bears the name of the donor, that asylum having been provided by the generosity of Dr. Crichton, who gave for this purpose a hundred and twenty thousand pounds sterling. The most important Royal asylums are that which has just been mentioned, and those of Morningside and of Montrose. The District and Parochial asylums are maintained by rates levied for the purpose in virtue of special enactments. There are thirteen of the first and six of the second category. The most important are Hawkhead, Woodilee, Hartwood, Stirling, Gartloch, and Perth.

Before discussing in such detail as it deserves the special management which characterizes the asylums of this country, it seems to me desirable to give a general idea of their material constitution, which will indicate at the same time the management adopted. The asylums are for both sexes, are almost always situated in the open country with large tracts of land adjoining, and some of them possess as many as three hundred or even four hundred hectares for cultivation.

The architecture adopted in the new asylums and in the additions made to the older asylums is similar to that of large private houses. Some establishments, such as the Crichton, Morningside, Hawkhead, and Gartloch, are so large and handsome as to give the appearance of baronial residences. Separate villas in the style of *chalets*, which bear the names of celebrated alienists, complete and beautify the group of buildings in many asylums. Some possess seaside villas of similar character, where

the insane stay for short periods for bathing. None of these buildings are surrounded by walls or have closed airing courts or stanchions in the windows, or anything that is suggestive of a place of confinement. For marking off parts of the grounds there are sometimes hedges or stone walls, but where there are walls they are so low that a child of six years old could get over them. All the asylums are surrounded by splendid gardens and parks, and in these last the patients engage with complete liberty in outdoor games, such as golf, lawn tennis, cricket, etc. And in these parks there may also be seen beautiful flocks of sheep.

The plan and general disposition of these magnificent edifices are subordinated to a principle of intelligent classification of the patients, which consists in their separation into four great groups, accommodated in the following sections: (1) the hospital, somewhat separate from the rest of the asylum, and reserved for the observation of patients recently admitted, for those of suicidal tendencies, and for those suffering from intercurrent maladies; (2) the pavilion for the curable; (3) the section for the chronic and incurable; and (4) the agricultural colony and workshops for the working patients. Besides these there are of course special sections for the administrative and general services. The pavilions consist generally of three stories, except the hospital, which has two stories. In the ground floor are the dayrooms, libraries, bathrooms, etc., and in the other two stories are the dormitories, attendants' quarters, etc. Excluding the patients in the hospital, who have a dining hall for themselves, the patients have all their meals in an immense dining hall, above which is the great concert room. The apartments are spacious, with large windows, and are decorated in refined taste. The walls are covered with engravings and oleographs, and at every step one meets with statuettes, terra cottas, vases and hanging baskets of flowers, and cages with birds, which all contribute to give an effect of beauty and cheerfulness. In some asylums I have counted as many as eight pianos. The furniture is simple, substantial and elegant.

But that which claims special attention in these establishments is the great amount of liberty which exists. The doors, both interior and exterior, are found open or at most fastened by a simple latch. From this circumstance and from the absolute absence of closed airing courts, of high walls, and of everything suggestive of confinement, has arisen the name of "open door" which is given to the Scottish system.

If we pass from this to examine the rest of the constituent elements of comfort, our admiration increases step by step, since no detail or improvement seems to have been omitted in the arrangements for lighting (electric in the majority of the asylums), for heating, for ventilation, for bathing, or for cooking, etc., etc.

It is evident that this admirable organization is attended with immense cost; and it is only a rich country, highly cultured, and where philanthropic sentiments are fully developed, that could arrive at such enviable results. The cost of all the public asylums of Scotland amounts to two million pounds sterling (thirty millions of our money). This information

is derived from an official return presented to the House of Commons in August, 1895, which gives the figures up to the end of December, 1893. Since 1893 there are in course of construction three new asylums, better still, if possible, than those that I have mentioned. It has to be noted as a mark of honor for the private charity of this country that more than the third part of this large sum corresponds to the cost of the asylums created by donations and contributions from private sources; and these are without dispute the largest, the most beautiful, and the most comfortable. We shall only indicate some details that will suffice to give an idea of their grandeur. The colonial section of the Crichton Asylum (Dumfries), for a hundred patients, with farmsteadings, dairy, piggery, stables, barn, etc., has cost fourteen thousand pounds sterling, the chapel of the same asylum thirty thousand, its concert hall luxuriously furnished can conveniently contain six hundred persons. The total cost of the asylum (for nine hundred patients) is three hundred thousand pounds. The new part of Morningside Asylum, for two hundred, has cost a hundred and twenty thousand pounds, which is not to be wondered at, since it surpasses in convenience and luxury all known similar establishments.

The number of the insane accommodated in the different asylums amounted on the first day of the year 1895 to eleven thousand and seventy-two persons of both sexes, and the number provided for in private dwellings to two thousand seven hundred and ninety, which gives a total of thirteen thousand eight hundred and fifty-two insane persons, a high figure if we keep in view that the population of Scotland is only four millions of inhabitants, that is to say, more or less the same as our own country, which has only one thousand seven hundred in asylums. It is true that this number is much below that of the insane not in asylums, and who ought in justice to have official assistance. Having indicated in broad outline the physiognomy of the Scottish asylums, there remain to be studied their internal management and the admirable curative results that are obtained; but as this would require me to extend my letter considerably, and it is already somewhat long, I prefer to make it the subject of a second letter. I desire, however, before closing to record my profound gratitude for the very cordial reception given me by those distinguished alienists Drs. Sibbald, Mitchell, Clouston, Rutherford, Macpherson, Robertson, Watson, and Campbell Clark, who made the performance of my task so easy and agreeable.

(Signed) DOMINGO CABRED.

SECOND LETTER FROM DR. CABRED.

Edinburgh, June, 1896.

If, as I have said in my previous letter, the asylums of this country merit all kinds of praise from the point of view of their structural arrangements, their internal administration equally deserves to receive commendation.

The great amount of liberty granted to the insane is one of the most remarkable features of the Scottish system. Those patients whose mental condition permits can go freely through all parts of the interior of an asylum, the doors, as we have seen them, being open during the day or closed with a simple latch. The patients are likewise allowed to go into the gardens and parks for exercise and to engage in games in the open air, and they may even, with special permission, ramble over the extensive grounds devoted to cultivation; and lastly, they may be permitted to go out of the establishment alone to visit their relatives and friends. Some of those who go out on leave are sent under the care of attendants, and others go on parole given by the patients themselves that they will not escape and that they will return to the asylum within the prescribed time. This practice of allowing patients to go out on parole, special to the asylums of Scotland, is an important element of moral treatment and in no way compromises either the order or discipline of the establishments or the safety of the patients. We have been assured by the Scottish alienists that it also produces an excellent effect. It preserves and develops a certain sense of responsibility in the patients. It is more worthy of notice that the parole is seldom broken by the patients. Indeed it is not broken more frequently than might be observed in any aggregation of sane individuals subjected to discipline. A few days ago I had occasion to be witness of an incident which gave an illustration of these absences on leave. It occurred in the house of the learned alienist, Sir Arthur Mitchell. I met there at five o'clock in the afternoon a gentleman who was one of our party at tea and whose conversation and manner was in every respect correct. After a short time he looked at his watch and said in the most natural way, "It is time I was going back to the asylum." He took leave of the lady of the house and of me in the most courteous way and went away without being accompanied by any one. He was a patient from the asylum at Morningside who for a long time has been in the habit of taking tea with Sir Arthur. When the patients are not honorably faithful to their parole they are subjected to restrictions of liberty for some time, restrictions which have the effect of relegating them to sections of the asylum which they cannot leave, or of subjecting them to constant supervision when they go out for exercise or work. At first sight it might be supposed that this great liberty granted to the insane would result in all kinds of accidents and escapes; but, as has been stated, this is not the case. According to the statistics in the last Annual Report of the General Board of Commissioners, the number of accidents in all the asylums of Scotland was 112. Ten of these had fatal results. Only three were suicides, the remaining seven being due to accidental circumstances. The rest consisted of fractures of the limbs, injuries received in struggles, etc., always inevitable in large aggregations even when not composed of the insane. As regards the escapes, they have not for many years amounted to more than two per cent., and this does not greatly disturb the superintendents of asylums, as they consider they are made up for and with interest by the liberty

which the greater part of the patients enjoy. It is easy to understand, moreover, that a patient who sees that his liberty is not restricted, who finds himself surrounded with comforts and who receives kindly treatment, does not generally feel a desire to escape, as happens when he finds himself shut up in a closed asylum. Such enviable results are due, apart from what I have said, to the care with which the patients are selected to whom this large amount of liberty is accorded, and to the constant supervision exercised over those who really require it. This supervision becomes the more effective the more the attendants are obliged to concentrate their attention on their patients. When an attendant cannot rely on high walls, enclosed airing courts and locked doors, he has to study the character and the tendencies of the patient committed to his care, and he is converted into a companion and friend who has no means at his command except kindly behavior and persuasion.

A certain number of the attendants possess certificates that they have received adequate instruction, and these certificates are not given to any attendants who have not been a certain time in an asylum and have performed their duties in a meritorious manner, and after they have passed a serious theoretical and practical examination on the mode of treating the insane. They constitute a body of the greatest importance as auxiliary to the medical staff. I ought to mention in this connection an interesting circumstance that I observed in some asylums, the nursing of male patients in the hospital section being entrusted to women, with whose carefulness and efficiency the superintendents are highly satisfied. The proportion of attendants is for the acute cases one for every five patients, and for the chronic one for every ten. The instruction of the attendants is under the patronage of the British Medico-psychological Association, to which all the medical superintendents of asylums belong and which publishes books for the purpose of such instruction. The remuneration of this class of attendants is high, and goes on increasing with the number of years of service. The ordinary attendants receive from three to five pounds sterling a month, and the head attendants from four to eight. Indeed all members of the staff of the asylums are well paid, beginning with the superintendents of Morningside and the Crichton, who have yearly salaries of two thousand pounds. Finally, when speaking of the *personnel* of asylums, I should not omit to mention that besides the superintendents there are in all the asylums several resident assistant physicians in the proportion of one to every hundred patients. These resident medical officers who devote themselves to the specialty of psychiatry form a special class, in which promotion is usually based on years of service, and they render most valuable assistance to the superintendent in his multifarious duties. The assistance furnished by these physicians is, of course, infinitely superior to that which can be given by resident students, who are really birds of passage in asylums for the insane.

The organization of labor has for a long time received very great attention on the part of asylum superintendents, as they are convinced of its capital importance as an element in moral treatment, as a means of

preserving discipline, and as a source of economy. The principal occupations in which both pauper and private patients are employed are such as can be engaged in out of doors, such as agriculture and gardening, but some are employed at such occupations as tailoring and shoemaking. The women are employed chiefly in the kitchen and laundry, and at needlework and household duties. The proportion of workers in pauper asylums is about 70 per cent. for men and 50 per cent. for women. Among private patients there are only about 38 per cent. for both sexes. It is calculated that the value of the work of a useful patient amounts to the half of the cost of his maintenance, which is on the average a shilling and sixpence per day.

The comfort which is to be seen in the asylums is very great, as I have already indicated when treating of their structural arrangements. The food is abundant and of good quality, and at meal-times it is very gratifying to see, gathered in the commodious dining halls decorated with flowers and plants, patients of both sexes seated at the same table in the greatest order and tranquillity, and it is no less agreeable to see the two sexes mingled at the concerts, the dances, and at the out-door games. These recreations in association are very frequent, and they constitute a precious element of moral treatment, as they tend to preserve habits of social courtesy.

Besides the principal features of the reform by which the Scottish system of lunacy administration has been so profoundly modified in its material and moral aspect, there remains to be indicated the curative results that have been obtained. The average number of recoveries during the last ten years is about 40 per cent., and the mortality during the same period about 8.30 per cent. Figures so consolatory in regard to mental disorders where the prognostic is so grave constitute the best eulogium that can be made on the Scottish system, especially if account is taken for an equal period of time of the statistics of the closed asylums of France, Italy, Spain, and other countries, which show a much lower number of recoveries and a higher mortality.

The conclusion from the above exposition is that the Scottish asylums have realized the desideratum to which Esquirol gave expression in the first third of the present century in respect to such institutions, since they have been converted from being mere places of confinement to veritable instruments of cure. For all this I have congratulated the distinguished alienists who are in the front rank in the branch of the public service devoted to the care of the insane in that beautiful country, and I venture to hope that no long time will elapse before we shall see realized in our own land the achievements that I have had occasion to admire.

DOMINGO CABRED.

THE PRATT BEQUEST TO THE SHEPPARD ASYLUM.—Few American communities can point to a munificence of public bequest equal to that which has characterized the giving of prosperous,

benevolent and enlightened Baltimoreans. Johns Hopkins, Moses Sheppard and Enoch Pratt are but types among a multitude of givers whose benefactions have shed lustre upon a fair city. Happy Baltimore! There is withal in her good works, notwithstanding an incomparable vastness of reach, a singular unobtrusiveness of spirit that seems to spring from that grand postulate of olden time, *noblesse oblige*.

Moses Sheppard shrank from the use of his name in the title of the great hospital near Baltimore which he created. He thought, as he wrote to a friend, that he could "proceed unnoticed." "I want no such monument to my living fame," was his protest, although he finally gave a reluctant assent. Quaker that he was, he despised seeming and show, and cared not for the modern public marking system that is so subversive of public morals. A great educator has warned us that men and women whose chief anxiety is to make a show before the world, who strive for "marks" in public estimation or notice in public prints and are not over-conscientious about the manner in which these things are obtained, can hardly help being in all ways selfish and unreliable. And yet, we submit, it is not selfishness to give an institution its founder's name, even though that name be prescribed by the founder himself, but an act of wisdom. After all, we may perhaps discern in such naming the same motive that in days of chivalry actuated the conferring of knighthood upon valiant and worthy men. "Equitee willethe and reason ordenieth," so read the patent, "that men vertuous and of noble courage be by their merytes and good renoune rewarded and had in perpetuall memory for their good name and to be in all places of honner and wourshippe among other noble parsons accepted and reputed by shewing of certain ensignes and tokens of vertue, honner and gentelnes to thentente that by *their Insaumple others shulde the more perseverantly enforce themselves to use their tyme in honorable wourkes and vertuous dedes*." This sentiment indeed is based upon yet higher authority, for are we not enjoined for the like purpose to let our "light so shine before men"? These reflections are not without bearing upon the bequest of the late Enoch Pratt of Baltimore to the Sheppard Asylum. This institution, already well equipped by endowment for the care of a limited number of the insane, is, by the terms

of Mr. Pratt's will, made his residuary legatee upon the sole condition that the name of the corporation now known as "The Trustees of the Sheppard Asylum" be changed to "The Trustees of the Sheppard and Enoch Pratt Hospital." This change would involve an amendment to the charter to be authorized by the General Assembly of Maryland. No other condition was imposed except the stipulation that the income only of the funds he devised to his residuary legatee shall be used in the same manner as was prescribed by Moses Sheppard. Enoch Pratt directed the erection of buildings for not less than two hundred additional inmates and the reception at the hospital of the *indigent* insane at "very low charges or absolutely free." When it is learned that his bequest amounts to sufficient, when added to a "very low charge" from those able to pay, to maintain two hundred insane "in the most advisable manner," one rejoices at the windfall that places the Sheppard Asylum prospectively in such an enviable position of enlarged usefulness and gives it the name of Hospital. But this jubilant feeling changes again to one of amazement when a doubt is intimated by some of the institution's friends whether the acceptance of the bequest under the new title as proposed and required under the will, would not in some measure dim the lustre of Moses Sheppard's gift—of the man who desired "to proceed unnoticed"! We confess that to us it seems a gnat-straining spirit to exhibit in the presence of a gift of such vast possibilities for good to the State of Maryland. Certain it must be that Moses Sheppard would have welcomed a conjunction of title that accords well with his own sense of greater modesty as expressed in his written words. To believe otherwise is to impugn alike the sincerity of his utterance and the object of his gift. The JOURNAL hopes and believes that the broader view will obtain and that the General Assembly of Maryland will in its wisdom, by amending the charter as proposed, make it possible for the Board of Trustees to enlarge the existing asylum into the greatest hospital for the care and cure of the insane that has ever been reared on American soil. Great because founded upon the broad principle of "improving" the care of the insane, because conducted by a board which is in earnest sympathy with the motive of the founder, and is untrammelled by conditions except such as are intended for the good of the insane now and

in the future. In the words of Enoch Pratt, here the acute insane, whose friends cannot pay for the full cost of their care or for any portion thereof, can under these combined endowments, be cared for "in the most advisable manner." Then, indeed, will Moses Sheppard and Enoch Pratt not be linked as to name merely, but bound inseparably in memory as equal benefactors of a class of sufferers whose needs cannot be too bountifully supplied.

THE AFTER-CARE MOVEMENT.—At the Baltimore meeting of the Medico-Psychological Association a committee was appointed to co-operate with a similar committee on behalf of the American Neurological Society to devise some system of after-care for patients discharged from institutions for the insane. At the time of the appointment of these committees it was anticipated that the whole matter would be brought before the Conference of Charities at its annual meeting in Toronto for concerted action on the part of alienists, neurologists and philanthropists generally. Owing to the fact that the movement was initiated at too late a date, nothing definite was accomplished, and the combined action hoped for must be deferred until another year. Meantime, it is gratifying to read the conclusions of the report of Drs. Stedman, Dana and Dercum, the committee appointed by the American Neurological Association, and to know the keen interest which the scheme has excited.

"First. It is the general and well-nigh unanimous sentiment of those who are the most conversant with the needs of the insane in this country that measures should speedily be inaugurated for the temporary relief of discharged recovered convalescent and improved insane patients of the dependent class by organized outside assistance.

Second. As a preliminary step, inquiry should be made of all such patients before they leave the hospital, regarding the mode of life, surroundings and occupation to which they are returning, and appropriate advice given by a medical officer of the hospital. This precautionary measure is, we believe, too often neglected in large institutions for the insane.

Third. The legal provision, whereby an allowance of money and clothing is made in some States to each patient on his discharge, should be adopted by all.

Fourth. Outside assistance can best be provided, we believe, through the medium of an after-care association which, until its utility be proven,

should be entirely a private undertaking, and should be organized like most existing charitable associations depending upon voluntary contributions. Obviously, a large city offers the best field for starting and developing such a system.

Fifth. The special methods of after-care relief by such an association should be those employed by similar organizations in other countries: England, France, Switzerland, or a selection of the best methods of each; these may be modified later to meet special conditions.

Such relief should, at first at least, be extended only to the class mentioned, and be understood as temporary, covering only the first month or two following the patient's discharge. The work may be best done by associates or agents appointed for the purpose, who shall find suitable homes and situations for all proper cases. There should also be systematic supervision of the homes by agents for the time specified or until the patient seems to be under good conditions for taking up life and work again. This applies also to patients returning to bad surroundings in their own homes. Reports should be made and records kept of each case.

Sixth. We believe it a duty that is especially incumbent upon this Association to take up in this way the work of the hospital physicians, and to see that the good accomplished in institutions be supplemented by proper outside supervision in appropriate cases; and we would urge its members to actively engage in the formation in their respective States, of relief associations for the after-care of insane patients of this class on their discharge from hospitals, and to endeavor to enlist in the work of co-operation all friends of the insane so far as practicable. To facilitate this, your Committee would suggest that a brief compilation from all available sources of the methods employed by such organizations abroad be authorized and published by the Association for distribution to all who are interested in furthering this work.

Seventh. Regarding State convalescent homes, there is abundant evidence of the most authoritative kind of the advantages to follow from their establishment, but, in our opinion, the first reform in the order of precedence should be the general recognition of the necessity of separate hospital treatment of insanity in its early and active stage, and the actual adoption of special provision for the "acute" insane as an indispensable step in the hospital treatment of public insane patients. Only when this result is reached should separate establishments exclusively for convalescents be added to the already large burden of expense for our dependent insane."

PATHOLOGISTS IN HOSPITALS FOR THE INSANE.—None of our readers can be ignorant of the fact that it has been rather fashionable of late years, in neurological circles, to reproach the hospitals for the insane of this country with the smallness of their contributions to the scientific side of the study of the class of patients

with which they are especially concerned. Although we do not think that sufficient allowance has, in all cases, been made for the difficulties of the subject, it can hardly be denied that there is some apparent justification for such strictures. Whether as a result of the application of the goad, or of a spontaneous awakening to the importance of the subject, there is evidence at present of a disposition to remove this occasion of reproach by the employment, in many institutions, of persons charged with this special duty. We believe this movement is calculated to be of great benefit to the interests of the insane. At the same time, the appointment of a person for this purpose, even if he is thoroughly competent, will not in itself be sufficient to secure all the advantages which are to be reasonably expected from it. Assuming that a suitable man has been selected, it is worth while to consider, for a moment, under what conditions he can do his best work.

The time is past, if it ever existed, when pathology could be supposed to be concerned merely with *post-mortem* conditions. Important as is the study of the changes produced in the organs and tissues by morbid processes, it bears about the same relation to the whole subject of the investigation of disease that the inspection of the premises after a burglary does to the catching of the thief. It is no more pathology than is clinical observation, or investigation into the etiology of disease. Every physician should be, in one line or another, a pathologist, and the pathologist *par excellence* will only be able to do his best work in association with other interested and intelligent students of disease. If the physicians who attend immediately upon the patients are ignorant, indolent, or overworked, if the patients are superficially observed and the clinical records ill-kept, the usefulness of the pathologist, however competent he may be, will be very much limited. If his time is taken up to any great extent in the routine examination of urine, sputum, and blood, and other similar work which any physician ought to be competent to do for himself, it is encroached upon to that extent for purposes of original investigation, and if the other members of the staff shirk such work because they have a pathologist, it may be worse for them, as well as for their patients, than if he were not employed.

It will, then, be for the advantage of the pathologist to enlist,

so far as may be, the interest and co-operation of the other members of the staff. To consult with them, clinically, over interesting cases; to give them the benefit of his greater leisure for reading, and, it may be, better acquaintance with foreign languages, in matters of practical utility; to engage their assistance in laboratory work, will not only benefit them, but add to the value of the data from which he has to work.

No one should be selected for such a position who does not show some interest in, and capacity for, original research. These and industry being given, an investigator should be allowed to follow his own bent, without being called to account because he is not able to report some startling discovery every year, or because he is not working on just the same line with some one else who is doing good work. The field is broad enough to give scope to the most varied tastes and talents, and a man who is fit for such work is likely to be a better judge than any one else of what he can do to the best advantage.

QUIS CUSTODIET IPSOS CUSTODES.—At the recent Conference of Charities held in Baltimore in November last, a portion of one day's session was given up to a discussion of the care of the insane and the mentally defective.

Dr. P. M. Wise, President of the New York State Commission in Lunacy, delivered an address upon "State Care of the Insane," which is printed in full in this issue of the *JOURNAL*. While the main facts stated by Dr. Wise are such as no one can successfully controvert, there are one or two points concerning which some of our readers may differ with him.

While urging the necessity, which to those familiar with the subject is quite obvious, of a reform not only in the care of the dependent insane, but in the lunacy laws of Maryland, Dr. Wise said: "Create a State Lunacy Department and endow it with executive power, not confine it to visitorial and reportorial functions."

Upon this point, in all of the discussions which have taken place or which have been published, concerning the functions and powers of commissions of lunacy, very diverse views have been expressed. If we look back to the organization of the first lunacy commission, the English, upon the model of which all

subsequent commissions have been formed, the object, or at least the main object, if more than one is alleged, of such commissions is very evident. This object has been the creation of a board of inspectors or visitors, with certain well defined powers (not a managing or executive board), which might visit, inspect, inquire, receive reports, digest statistics, but whose main value was that, in behalf of the public, it had sure and ready means of access to all places where the insane were confined, and could judge for the public of the conduct of such institutions.

Such a board stands between the public on the one hand and the institutions, their managers and officers on the other. It can disarm unjust criticism and suspicion, or it can, where abuse is found (if active and efficient, and awake to its duties and responsibilities), set in motion the proper machinery of the law to remedy such abuse. In England and in those States which have boards intelligently informed upon their duties and responsibilities, much satisfaction has been felt by the public in the possession of such means of information, not so much that the poor rates were economically expended, but that their unfortunate friends and relatives in institutions were scientifically and humanely treated.

Can such satisfaction be assured from the existence of a board endowed with executive power? Such a board is at once, we believe, placed in an embarrassing position, and its greatest usefulness, not only to the public, but to the patients in institutions, is rendered weak and doubtful for the reason that it must explain, judge, excuse or condemn, acts for which it, by reason of its executive functions, is in a measure responsible.

We are all aware of the great work accomplished by the New York Board in carrying out State care, but one does not always have to read between the lines to find excuses and explanations, defence of acts and orders, which would come with better grace from such a board regarding the work of others rather than its own.

Who shall judge for the people of the wisdom and justice of the executive duties and the rules and orders of a board so endowed? The care of the insane is a great and growing problem in every community, and economy must be inculcated and practiced. If the standard of care, the plans of buildings, the price

of fish and flour, the dietary of patients, the clothing, occupation, etc., must be fixed by a central board, to secure greater economy of expenditure and a military uniformity of methods and reports, well and good. The great question, however, is constantly coming up, who, out of all this centralization of power, shall have the custody and report upon the custodians themselves.

The fathers and mothers, husbands and wives of the insane do not care one whit what uniform is prescribed for the farm laborers and herdsmen of institutions, but they do ask, Who can tell us that the standard of care fixed is carried out? How are our friends and relatives treated? Do you visit and inspect and report, and if so, upon whose work and rules do you report? Are you really unprejudiced?

We have watched with interest and admiration the energy and efficiency of the New York Board; we have often wished that some of these qualities might be imparted to other boards, but we are yet to be convinced, admirable as in the main are the results of the executive work in New York, that a great work does not yet remain in most of our States for a board endowed solely with "visitorial and reportorial functions."

Abstracts and Extracts

DIABETES AND GENERAL PARALYSIS. (DIABETIC PSEUDO-PARALYSIS).—R. Laudenheimer (*Archiv für Psychiatrie*, 29. Band, 2. Heft) considers the relations of diabetes to general paralysis as to symptoms resembling those of general paralysis. From a review of the somewhat scanty literature of the subject, and from the study of several cases, the following conclusions are derived:

1. That it is not yet determined that true diabetes causes true progressive paralysis, because in the cases up to this time so regarded, other causes have not had due consideration, and autopsies have not been made.

2. In occasional cases of diabetes there appears a symptom-complex of motor and mental weakness, which yields a complete clinical picture of general paralysis, which, so long as its anatomical basis is not known, may be diagnosed diabetic general paralysis.

3. The specific diabetic nature of this disturbance is shown in one case of the writer's by the prompt reaction under an anti-diabetic therapy.

RECOVERIES FROM MELANCHOLIA FOLLOWING REMOVAL OF INTERSTITIAL FIBROMATA FROM THE CERVIX UTERI.—Holmes (*Am. Gynecol. and Obstet. Journ.*, Oct., 1897) adds three cases to those previously reported by him. This experience has convinced him that puerperal mania is nearly always dependent on some lesion of the generative organs. In 1885 he presented a report of fourteen cases, in which recovery had followed treatment of the pelvic organs, and since then ten additional cases of this form of insanity have been cured by him in a similar way, and three cases of apparently incurable melancholia associated with interstitial cervical fibromata have resulted in complete recovery on removal of the tumors.

The writer concludes that affections of the cervix and lower segment of the uterus produce a much more profound impression on the mental and nervous condition of women than disease of other parts of the generative apparatus, and that next after these tissues the vagina seems the most susceptible. He has on many occasions seen an aggravated vaginitis produce great mental irritability, and on one occasion he observed a case of violent puerperal mania recover under treatment directed to an inflamed vagina.

CONGENITAL FACIAL PARALYSIS.—At a recent meeting of the Society of Neuropathology and Psychiatry in Moscow, Dr. Minor showed a case

of this character presenting some interesting features. The patient was twenty-six years old. He was born of an intemperate mother, but no instruments were used at his birth. He was, however, much asphyxiated, being of a dark blue color all over. At the moment of birth it was observed that the face was strongly drawn to the left side. This condition still persisted, and in an aggravated form, but psychical development had gone on naturally until he was eighteen years of age, when he began to suffer from epileptic attacks. When he was shown there was facial paralysis on the right side. The zygomaticus major had escaped, and so had the upper part of the orbicularis oris. The platysma was much atrophied, and no electrical response to either current could be obtained in the muscles other than those mentioned as having partially or wholly escaped. Dr. Minor regarded the condition as the result probably of an intrapontine lesion, perhaps a hæmorrhage in the facial nucleus occurring at the time of birth, and associated with the asphyxia which was present. Some speakers, however, thought that the lesion might be in the nerve. Similar cases, it is pointed out, have been described by Schultze and Bernhardt, and also by Mobius. The last-named has described them as cases of nuclear disappearance in infancy.—*Lancet*, Oct. 9, 1897.

RELIGIOUS INSANITY.—According to M. Baderot, *Thèse de Paris*, (Gas. hebdomadaire, July 4) religious insanity is a very common type amongst the inhabitants of Brittany. It tinges all forms of mental disease, but is especially common in the more debilitated and degenerate cases. It is also frequent in alcoholic insanity. The delusions which are very persistent are generally terrifying, and ideas of damnation prevail.

To show the frequency with which this element tinges insanity, M. Baderot gives the figures of admission for the Rennes Asylum from January 1, 1896, to April 15, 1897. In one hundred and twenty-one male admissions it was present in twenty-five, or a percentage of 20.66. In one hundred and forty-three female admissions there were forty-nine suffering from religious delusions; a percentage of 26. These figures much exceed the general average in asylum admissions, at least in France, in his opinion.

HOMICIDAL, AMNESIC, TRANSITORY FRENZY.—Dr. Bancroft reports two cases (*Boston Medical and Surgical Journal*, October 14, 1897). The first was that of a man of neurotic temperament whose domestic relations were unhappy. When the oldest daughter of the unhappy union reached the age of seventeen years the mother deliberately encouraged her entering a road house, separating herself and the daughter from the husband and other children. The knowledge of these facts goaded the husband to desperation. He grew depressed and gloomy. Gradually it was noticed that he was out late at night, that he watched the house in which his wife and daughter lived, and on returning home he would skulk behind trees, casting furtive glances over his shoulder, as though fearing pursuit. His wife finally began action for a divorce. While in the midst of this dread

he met, one morning at the railway station, his wife with one of the youngest girls. For several moments he tried to secure an interview with his wife, who dodged about the station. At last he came up with her on the platform. He was noticed pleading earnestly with her and the child, finally drawing both from the platform out in the street. Suddenly he drew a dirk knife from his breast pocket and nearly severed his wife's head from her body. He plunged the blade again and again in her breast. He made no opposition to arrest. In subsequent examination as to his sanity he never revealed any knowledge that his wife was dead, but stated that he remembered going to the station to plead with his wife not to get a divorce and take away his daughters. He remembered being distracted with a flood of conflicting emotions, fear for his own life, dread and horror for the fate of his daughters, anguish over the course his wife was pursuing. Suddenly all turned dark; he seemed to be in a whirl of confusion, and all he could recall was a struggle and a crowd of men pressing upon him.

The second case was that of a man seventy-nine years of age, who, for several months, had had delusions of suspicion and fear, with aural hallucinations. He had two sons, and thought that one of them with whom he was living was going to kill him, though there were no grounds for this feeling. He finally changed his residence to live with the other son, against whom he entertained no suspicion. He retained his fear of the first son, and was often seen looking behind trees and over his shoulder as though he thought some one was approaching from behind. He desired the family to keep the gun loaded and the doors and windows securely fastened. He was very deaf, and was easily startled, as by a slight touch, of any one accidentally brushing against him.

One day he was sitting in the kitchen. His grandchildren, a little boy about six years of age, and a girl about thirteen years of whom he was very fond and proud, were sitting on the floor bounding a ball between them. They would throw the ball on the floor, making it bound up to the ceiling and back again to one another. The old man sat in a chair with his back toward them, apparently having no thought of the children. The ball with which they were playing was a very light one. Suddenly it glanced back from the ceiling, striking the patient on the head. Instantly he started up in a frenzy of fear and excitement, seized a small hatchet that happened to be near, and rushing furiously toward the little boy, struck him on the head, fracturing his skull and killing him instantly. The little girl ran for the door screaming, but her grandfather reached her, made two or three slashes on her neck, shoulder and her scalp behind the ear. Fortunately the wounds were not deep enough to kill her and she eventually recovered. After inflicting these wounds on the girl he rushed out wildly into the road. The cries of the girl had attracted the attention of the neighbors who lived opposite and who ran out to ascertain the trouble. They found the patient panting with fear and excitement, talking disconnectedly, and apparently much dazed. He had not been drinking, and apparently, so the neighbors said, had no realiza-

tion nor recollection of what he had done. It is to be noted here that he did not at the time make any allusion to the homicidal act, nor ever afterward has he alluded to it. The entire occurrence was a blank to him.

In neither of these cases was there ever any record of epilepsy in any of its forms. The mental factors of the homicidal frenzy were unconsciousness and amnesia. In both cases there existed the most persistent state of mono-ideism. Presumably, an extremely limited circle of ideas was accompanied by functional associative activities in limited brain areas. Not that the entire brain did not perform the functions essential for ordinary life, but long-continued mono-ideism favored the functional exercise of certain brain paths more markedly than others. Consequently nervous activity sought these particular channels rather than others.

Both these cases lived in an unspeakable terror, both by day and night, that they were to be killed. In addition to this, in the first case the most horrible dread that a father could experience dominated and shadowed his daily existence like an awful cloud. He felt that his daughters, in whom his whole heart was bound up—even the little one scarcely out of her baby dresses—all were to be made common prostitutes in the course of time.

Both men had sought to arm themselves and prepare for the fatal moment which was likely to come upon them at any time. In the second case it was death; in the first it was not only his own personal death, but the moral degradation of his daughters.

Dr. Bancroft questions the occurrence of a transitory frenzy in an otherwise normal man, but in both these cases there existed a mental sub-soil and psychical conditions favorable for the exhibition of an explosive psychosis, and he concludes that there may be a subliminal consciousness, that certain brain paths may be in active operation to the exclusion of certain other tracts that usually are, through their associative action, identified with the normal empirical consciousness—all this seems plausible and not inconsistent with what we already know of brain physiology and pathology.

THE RELATION OF MENTAL DISEASES TO GENERAL MEDICINE.—Under this title Dr. Cowles summarizes the practical results of recent advances in psychiatry. (*Boston Medical and Surgical Journal*, September 16, 1897). A contrast is drawn between the "depleting treatment" of the first quarter of the century and the "supporting treatment" which accompanied the establishment of the scientific medicine of to-day. In appreciation of this principle alienist physicians have been leaders; Van Deusen's theory of "neurasthenia," a term introduced by him, antedating the publication of Beard's conception of "nervous exhaustion," manifested by "irritable weakness." The study of the nervous system and the exposition of the degenerative *sclerosis*, to which it is subject, have shown one great truth—that overwork and exhaustion may be potent causes of nervous disease, not only of a functional, but of an organic character, and the great significance of this, in relation to mental diseases,

lies in the inference that anything which interferes with the maintenance of proper nutrition of the neuron may begin by abating power in the mental function. The relation of mental to general diseases, on clinical lines, is thus a close one. The best advances in psychiatry have been made by the application of medical common sense, and there is no mystery in the adaptation of the principles of the "supporting treatment" to the needs of the insane. Such objective symptoms as might be noted, *e.g.*, constipation, dyspepsia, neuralgia, etc., would be palliated by the means any physician might employ, but this would be done with the understanding that they are all likely to be only expressions of the prime condition, which calls first for elimination, nutrition, rest and sleep; then for mental and physical hygiene; and then, as convalescence progresses, for proper exercise, entertainment, occupation and gradual restoration to self-responsibility.

Dr. Cowles reviews briefly later advances in the study of toxic influences, and of the anatomy and physiology of the nervous system, and concludes with a warning which may not be without value to hospital physicians as well as to a general medical audience:

"Now that mental pathology is becoming clearer in the light of general pathology, shall not a new interest arise in the study and treatment of insanity? Already the practice of alienists is getting upon new lines. Great success has been attained in some torpid mental and bodily states of long standing by the use of thyroid extract. Much attention is being given to the disinfection of the intestinal canal and its systematic and thorough evacuation by high enemata. Elimination of retained auto-intoxicants has been attempted with some success by the subcutaneous injection of large doses of a solution of common salt. These and other procedures are still largely experimental. But whatever you do, while you exhibit all the effective tonics, of which nutrition, rest and sleep, are the best, there is one controlling practical principle to be remembered, and, with this, one special caution. It is a safe rule that mental symptoms always mean weakness; excitement is an extreme degree of irritable weakness, in which there is great exhaustion in the mechanism of mental control. This thought should beget care in the use of sedatives and hypnotics. Beware of the coal-tar compounds and the like; they are good and sometimes necessary for proper use, but not for many days in succession. Change them and omit for a while; they go against nutrition, and drug intoxication often aggravates the disease and is mistaken for it. When your patient is taking food well, be content with his getting two or three hours of sleep or less in each twenty-four hours, even when excited. Such sleep is better than when it is drug produced. When the appetite flags and sleep is not produced by persistence in hypnotics, the complete suspension of all medicines, and frequent feeding, will often be followed by gradual cessation of excitement, a clearing tongue, and improvement in sleep. These brief hints are simply mentioned by way of example. Above all things it should be remembered that the indication is always for a "supporting treatment."

THE PRODROMES OF PARESIS.—Thomsen (of Bonn) read a communication on the early prodromal symptoms of paresis, at the International Congress of Neurology, Psychiatry, Medical Electricity and Hypnology, at Brussels, September 14 (reported in the *Progrès Medical*), the chief points of which are given as follows:

It is an incontestable fact that general paralysis is often unrecognized by practitioners, which is explainable by the following facts, (1) The duration of the disease is often longer than is believed; 5, 7 or 10 years is not very uncommon. (2) At the beginning the purely physical symptoms may so predominate as to cause a diagnosis of neurasthenia or cerebral syphilis. Moreover, there are frequently long and pronounced remissions during which all the psychic symptoms disappear. The anatomical basis of paresis is a process that is liable to remissions and which attacks very different nervous regions; hence follows the very marked difference between the symptoms and the cause of the disease. When the paralysis is manifest the anatomical process is well advanced. (3) It is not enough known that certain characteristic symptoms may precede the outbreak of the disorder a long time, even many years, as isolated or prodromal symptoms.

The Argyll-Robertson pupil, Westphal sign, transient ophthalmoplegias, paralytic or aphasic attacks, disturbances of articulation, optic nerve atrophy, and many others are of this category. Where these prodromata are met with in the history or in the *status praesens*, it is very often possible to make a certain or probable diagnosis long before the psychic symptoms appear; their recognition often relieves a possible confusion between this disease and cerebral syphilis or neurasthenia. It is very important to diagnose paresis in its early stages.

In the discussion following MM. Regnier and others agreed with Prof. Thomsen in making a distinction between paresis and cerebral syphilis.

THE ETIOLOGY OF PARESIS.—At the recent International Congress at Moscow a paper was read on this subject that is of some interest, in view of a certain still disputed question as to the agency of syphilis in the causation of paresis.

After noticing the general effects of the stress of modern civilization and the great increase of late years of the cases of the disease, he mentioned syphilis as the most important factor, and possibly as the one essential one (as likewise of tabes), and reported an experiment made in his clinic that has an important bearing on this question. Eight paretics in the advanced and hopeless stages of the disorder were inoculated with fresh secretion from a chancre and then kept under close observation for 180 days. In none of the eight was there any syphilitic manifestation whatever, and the conclusion is deduced that they were all latent syphilitics and hence immune to infection. The experiment is the more significant from the fact that in none of these selected cases had any primary manifestations of syphilis been observed.

As additional evidence of the luetic origin of paresis, Krafft-Ebing

adduces the facts of congenital syphilis in juvenile paresis, the greater frequency in urban communities than in the rural districts, its frequency amongst military men and its rarity in priests and females of the higher classes. Where syphilis is rare, paresis is also rare, its chief causes may be stated as "civilization and syphilization." Its advance must be checked by reducing the progress of syphilis.

THE SO-CALLED (EXTERNAL) DEGENERATIVE STIGMATA OF PARESIS.—P. Naecke, *Neurolog. Centralbl.*, Sept. 1 (preliminary comm.) reports the results of the examinations of 100 male paretics undertaken for the purpose of determining certain facts in relation to the etiology of the insane. For comparison 80 male hospital employes were also subjected to examination.

Of the 100 paretics, only 45 belonged to the cultured class, indicating the tendency of the disorder to extend amongst the uneducated. Most of the latter were from urban populations, where the stress of life is greater and the acquirement of syphilis is most easy. Most were admitted first between the ages of 36 and 40; the youngest was 25 and the oldest 56. All but thirteen were or had been married.

Hereditary taint (in the stricter sense) was found in 37; in 19 insanity in the family (in one case paresis). From the imperfection of the record Naecke thinks that 45 or 50 per cent would be nearer the true figures.

Syphilis was sure or probable in 43 per cent, which may also be taken as only a minimum figure. The objective signs were few and insignificant. In the known cases there were generally ten years or more between the infection and the paresis. The majority also of the specific cases had also hereditary taint.

Of other causes, intemperance was singly alleged in four cases (none of them absolutely sure), but was more frequent combined with other factors. Head injury by itself four times, but also more frequently in combination, and emotional disturbances six times by itself, and combined still oftener. Syphilis was in no case uncomplicated; one or more, commonly several other factors coexisted.

Dividing the paretics into two groups, those with predominant excitements and the quieter class, Naecke found, in 82 cases, 69 per cent of the latter. The assuredly syphilitic cases were divided about equally between the two. Paralytic attacks were observed in 53 per cent. Like other symptoms of the disorder, they seem to be of late less frequent and milder, and the average duration of the disease appears to be increased to three years and over.

The normal individuals used for comparison were generally young; 34 had been in the army, only two were weakly, and 12 undersized. Hereditary taint existed in 17.5 per cent, and probably more; none of them were absolutely free from abnormalities, and some of them had a whole series of stigmata. The value of these signs must therefore not be overestimated.

Careful and patient research on this point amongst the paretics demon-

strated that (1) they possessed an excess of these stigmata above normal individuals; (2) that they were more marked where they existed; (3) that the more important degenerative signs were found in the paretics, and (4) that their distribution over the body was more general than in the normal cases. Moreover, they were more common in the hereditarily tainted, and more pronounced; this was also the case with the uneducated as compared with the cultured individuals.

Thus, in about one-half the paretics we find the disorder occurring in a predisposed brain, as shown by the high percentage of abnormal heredity and the predominance of degenerative stigmata, and we find further that congenital peculiarities of character are especially common in these invalids. The non-congenital or hereditary weaknesses are also probably equally frequent.

Naecke claims to find a larger proportion of illegitimate births among paretics than is normal, and more cases of difficult birth; and that their offspring show more abnormalities than others. In fact, he concludes that they are generally cerebrally imperfect, and that this predisposition, either congenital or acquired through their lives, makes them ready victims to various exciting causes of the disease, chief among which seems to be emotional disturbances. Specific disease is, however, not essential; it may be lacking. It cannot in any case, in his opinion, be accepted as the sole cause, and is generally only a predisposing factor in an already invalid brain, rarely a direct exciting one.

He proposes in a future memoir to give fuller results of his as yet incomplete researches on the brain defects that favor the onset of paresis, which he thinks are more complete than have heretofore been made. They will, he believes, so prove the fact of the cerebral degeneracy in most paretics as to reveal to us the disorder in a different light than it has been thus far viewed.

IMPRISONMENT AND INSANITY.—The *British Medical Journal*, September 11, 1897, makes some interesting comments upon the report of the Commissioners and Directors of Prisons for the year ending March 31, 1897, particularly upon the data relating to imprisonment and insanity. The total number of insane dealt with in local prisons was 380, of whom 216 were remanded for observation, and therefore already of doubtful mental state on committal. The majority of this number were found insane on arraignment. Excluding these cases, 164 remained, of whom 34 were recorded as having been previously insane and 121 were found to be insane on reception, so that only 43 of the whole number developed symptoms of unsound mind in prison. Analysis of the 43 cases developing in prison shows that 6 occurred within one week, 6 within two weeks, and 7 within a month. It is, therefore, obvious to any one who has even a superficial acquaintance with the development of mental diseases that imprisonment can have but little to do with the causation of any of them. Subtracting the 19 that became insane within a month, 24 cases remain which developed at a later period. Of this number only 5 cases

occurred after the completion of six months' imprisonment, the remainder occurring before the expiration of that time. These facts are, therefore, quite inconsistent with the view which has been reiterated from time to time in the daily press, that imprisonment gives rise to insanity; in fact, these figures seem to show the contrary.

W. L. B.

MENTAL SYMPTOMS OF DIABETES.— Dr. De Veny reports a case of glycosuria with insanity in *Medicine*, October, 1897. There was marked and decided insomnia, controlled only by half-grain doses of morphine at bedtime, repeated in two hours, when relief was usually effected. The patient also manifested an inordinate craving for brandy, having been during his active business life rather abstemious. He took from two to three quarts of brandy daily. On diminution of the amount of sugar in the urine mental symptoms made their appearance. The patient was restless, agitated, had a disinclination to take food lest his family be ruined, claimed that he had lost everything and that it was necessary for him to go to the poorhouse, albeit he was wealthy. His attempts to wander off to the poorhouse necessitated the constant presence of a nurse. Although resembling the senile mental state even to the presence of erotic hallucinations, still the patient was in a mental condition more of a confusional type, since he could be temporarily recalled by questions from his son and partner in relation to his business. He was exceedingly exact in figures, and under questioning displayed a clear knowledge of his financial condition. This was in decided contrast with the delusions about the poorhouse, which immediately became dominant when he was allowed to sink back into his ordinary mental state.

While he was under observation the urine at no time exceeded forty ounces per diem. The sugar reaction, though always present, diminished or increased with the predominance or decrease of the mental disturbance. After some months' treatment at the Wauwatosa sanitarium his mental state so improved that he could once more be treated at home.

He then had loss of power in the left arm and both legs; the right arm was not at all affected; the legs and arms on both sides were, however, somewhat atrophied. The gait was decidedly ataxic. The tendon reflex was absent on both sides. Ankle clonus was present on both sides. His speech was slightly affected, and there was syllable stammering. After some time his mental symptoms began to reappear. The memory, however, at no time was affected. In this respect the mental state differed markedly from the senile mental state, which it otherwise simulated very much. The details of business even at the height of the mental disturbance were never forgotten, and sound advice was given to his sons in relation to it. At different times there was intense itching of the skin, and abrasions were difficult to heal. After some five years' treatment at home the patient's general state grew gradually worse. Carbuncles frequently appeared and exhausted the patient. He always complained of tenderness over the epigastrium, and was frequently jaundiced. Medicinal treatment was difficult, as suppression or diminution of the sugar in the

urine would cause an increase of the insane restlessness and a consequent decrease of the patient's strength. On the other hand, if the glycosuria were not checked to some extent the ordinary physical complications of diabetes were increased. Toward the end the patient declined to hold any intercourse with his family, was exceedingly apathetic, and took food only when compelled to do so. He refused it on the ground that he was unable to pay for it, and that by taking it he would starve his family to death.

KATATONIA.—An exhaustive discussion of this condition is given by Peterson and Langdon, in the *Medical Record*, October 2, 1897. The literature of the subject is reviewed and four illustrative cases from the wards of the Hudson River State Hospital are reported. The term is applied to a certain group of psychical and motor symptoms, which has often been considered as constituting a new and distinct form of insanity, but there is great diversity of opinion in regard to this.

The authors' study of the subject and of these cases leads to the following conclusions:

1. Katatonia is not a distinct form of insanity, not a clinical entity.
2. There is no true cyclical character in its manifestations; hence it cannot properly be classed as a form of circular insanity.
3. It is simply a type of melancholia.
4. It is not desirable, therefore, to retain the name katatonia.
5. The term "katatonic melancholia" or "katatonic syndrome" may be usefully retained as descriptive of melancholia with cataleptic symptoms, verbigeration and rhythmical movements, but should be strictly limited to this symptom-complex.
6. The prognosis in melancholia with katatonic symptoms is more grave than in any other form.
7. The treatment of the katatonic syndrome is the same as for other types of melancholia.

Book Reviews

Hallucinations and Illusions. By EDMUND PARISH. Scribners, 1897.

This book is enlarged from a German edition of 1894. Primarily it is a criticism of "The Report," made by the English Society for Psychical Research and kindred organizations, regarding veridical phenomena and "waking hallucinations." By way of thoroughness Mr. Parish reviews "the whole field of sensory delusion," normal and pathologic—whence we have a valuable monograph for psychology and for medicine.

Historically the book is ample, and the important points are well brought up to date. Beginning with the early explanation of "inadequate stimuli" (Joh. Müller), the "centrifugal" theory of hallucination and illusion is then reviewed under its various phases, namely, of "psychic projection"; of "ideas initiating and guiding the central apparatus of the sensory nerves" (Griesinger, Kraepelin); of "central action upon the sub-cortical sensory centres" (Hagen, Schüle); and, finally, in case of full-fledged hallucinations, of "centrifugal waves reaching the peripheral sensory organs," as the retina (Krafft-Ebing, Despine, Tamburini, Sergi, Lombroso, Ottolenghi). Rejecting all these, the author then plants himself on the doctrine that "the centres of sensory perception and the representative centres are identical."

Thus far the majority of experts are likely to agree with Mr. Parish. Yet immediately there rises the question as to precisely where the limits of these conscious centres are to be drawn. And when he decides for the cortex alone, as we understand him to do (the author is here, unfortunately, vague, in view of his criticism of other theories involving this point), Mr. Parish is apparently on ground that the latest authorities growingly incline to consider doubtful.

Arriving at his most intimate theories regarding hallucination and illusion, the author declares them both to be phenomena of "disassociation." Also, both originate in external stimulation, "not in one specific sensory stimulus, but in the general fact that the nerve-tract of the sense affected is at work; that instreaming currents from the periphery discharge the elements of the 'hallucinated centres.'" Whether hallucination, or illusion, or normal perception result, from the same stimulation, depends on "the cerebrostatic conditions present at the time." When the association paths into which the stimulus normally irradiates are "obstructed," either through "sleepiness," or through "exhaustion of the elementary group" so involved, and when at the same time "a certain close-knit group of elements is in a state of high tension," then

the stimulus "will be forced to discharge toward the group which has perhaps never before been affected by it":—this is hallucination. When "the excitability of the neural elements is low, a great number of the stimuli flowing into the cortex are not powerful enough to start the neural processes." As a consequence, certain parts of the customary association-group "drop out," and the result "misrepresents the sensation for which it stands because it is incomplete, and lacks the correction and adjustment which the dormant elements in consciousness could alone have supplied." This is illusion. Since hallucination and illusion are both initiated by external stimulation, the author reduces all false perception "to one type"—that of "illusion" commonly so-called.

It is doubtful if all the views of the author will find acceptance. When he declares that we should regard certain hallucinations as "illusory interpretations of morbid stimuli . . . originating in a pathological condition of some part of the central organ," this seems much like abandoning his contention that hallucinations and illusions may be reduced to one type in so far as external stimuli or objects are concerned. Moreover, it is not likely that many persons will concede that ordinary illusions—say those of binocular vision—are due to abnormal "disassociation, and to the exhaustion of the neural elements by which it is explained." Some illusions, at least, seem to us best explained as perfectly normal reactions to *unusual groupings* of outer stimuli. Throughout the book we feel that too much is made of this hobby of "disassociation." Continually we are forced to inquire why everything is thus credited to "exhaustion" of the centres, rather than sometimes to "excessive irritability," and why are *all* hallucinations and illusions forever spoken of as "blocked," "inhibited," or "split off" associations, while heightened or over-wrought association is conceived to be impossible. We hardly follow the author when he reduces "heightened tension" to "disassociation"; or when he declares that "if hallucinations occur in states of apparently accelerated association, as in mania, the excited period of circular insanity, etc., this arises from a misunderstanding of these states, which are really states of disturbed, and thus of *partially impeded association*." We find, also, other evidences of driving a good horse to death; for example, when *all* "audible talking" hallucinations are explained as "unconscious whisperings."

On the whole we incline to think that, while Mr. Parish has produced a valuable work, he is at his best when giving a scholarly summary of current views, rather than when attempting constructive explanations of his own.

It was Mr. Parish's primary purpose, however, to confute the Psychical Research Report. This report declares that its census, taken from 27,329 persons, shows far more veridical perceptions (such as premonition of death) than can be deemed coincidental. The author, by his preliminary wide handling of his subject, is enabled to bring forward what appear to be sufficient explanations of these occurrences, upon less mysterious grounds. Even he finds grave error in the mathematics of The Census,

in that it counts each person, who reports having had a veridical perception, as an undivided unit of percentage in favor of true premonitions; whereas each individual should only count such a fraction here as his apparently true premonitions represent of *the total number of fancied announcements, both true and hallucinatory, which he has had during the years specified*. Or to state the point in rougher words than Mr. Parish's great courtesy and tenderness permit to himself: the truth of premonitions, instead of being computed, as it were, on the percentage of old maids who report having found a thief under their bed, should rather be based on the ratio of true finds to the number of times that each maid has looked for an intruder. We must agree with the author that this oversight "invalidates" the conclusions set forth in *The Report*. And we may do this while remaining in doubt as to whether or not there are such things as true "mediumistic," "telepathic" and "veridical" communications. The Report only makes clear that if there be such communications, it is next to impossible to arrive at a just estimate of them by any sort of census method based upon voluntary reports.

The New Psychology. By E. W. SCRIPTURE, Ph. D. (Leipzig), Director of the Yale Psychology Laboratory. Scribners, 1897.

The general notion for the production of this book was good; there is need that some one shall harvest the accumulating experiments of this field, to condensed, harmonious, readable form. Any attempt at this cannot be wholly without value, perforce of the richness of the material at hand. It is only by a travesty upon megalopsychy, however, that the title, "*The New Psychology*," should be put upon such a work.

Chiefly the book is a paranoiac account of a narrow range of investigation and apparatus in which the author is absorbed. It contains 44 foot-note references to publications by the author, and 20 more to those of his laboratory pupils; not to speak of a still greater overbalancing of the text. Some estimate of the reliance that may be placed upon the book may be drawn from the following example: Although overwhelming contradiction has been heaped against the author's experiments in "mediate association," this fact is passed over, in the author's voluminous account of the subject, by a foot-note stating merely that "several other investigators have failed to find cases of mediate association." In a spirit of warm tenderness toward Yale University we draw a curtain over the number of times the words "Yale Psychological Laboratory" occur.

To any one who has framed the conception that the New Psychology, of current fame, is a broad discipline, inspired by the wide evolutionary spirit of modern times, and sending deep, vital roots into natural history, into comparative zoology and physiology, into child study, and into the psychology of "crowds," of "society," of "history," and of all sorts of races and conditions of men, to such a one this book will come with saddening enlightenment. Even it has no lesson to learn from modern neurology, either normal or pathologic. The experimenter "cannot spend time on physiological speculation and anatomical metaphors,"

much less upon "arm-chair philosophizing." He has but to accept the purely non-metaphysical assumption that, in modern physics, "space is a form of energy," and then to sail ahead, confining himself wholly to "observation" and "measurement," i. e. without "arm-chair" reflection of any kind, not even so much as was bestowed upon the observation and measurement of the alchemists.

The previous book by this author, "Thinking, Feeling, Doing" (1895), he declares to have been brought forth for "the average unscientific reader." It is difficult to conceive the degree of "unscientific reader" for which the present edition is intended. In alternate lines, it ranges between expositions too childish for children, and oracular dogmatism outfathoming all modern physics and metaphysics combined. The facility of literary disjunction accomplished in these inharmonious leaps is only excelled by the masterly sweep with which long strings of unrelated declamation are whirled to concentric and indubitable conclusions.

The book is the product of such enthusiastic labor, and the former book has received such unmerciful censure, that in pure mercy, if not in entire justice to the author, we refrain from further comment, begging only that no one will soberly take this for "The New Psychology."

Sexual Disorders of the Male and Female. By ROBERT W. TAYLOR, A. M., M. D. Lea Bros. & Co., New York and Philadelphia, 1897.

The first work by Dr. Taylor on the Pathology and Treatment of Venereal Diseases, 1895, made for him a well-earned reputation, and this last book will add to the author's fame. Although based more or less on his first volume, this production has in it much that is new and valuable. It is meant not only for the general practitioner, but the specialist, and it gives us pleasure to recommend it without any limitations to the medical profession. It covers the whole ground of these disorders in a most thorough and concise manner; nothing of importance is left out, and nothing unimportant added. The treatment advocated throughout the book is conservative, but represents the best opinions of the day in these matters, and the difficulties in the treatment are distinctly stated and clearly met. We are glad to note the stress the author lays on the value of gradual dilatation of strictures in chronic posterior urethritis as against the plan adopted by so many good as well as bad practitioners, of immediate cutting; with dilatation, if properly carried out as described by Dr. Taylor, the ultimate cure, though it may take longer to attain it, is surer and in the end more lasting. The author's treatment of chronic prostatitis is also excellent; but there is no part of this work which is not good and which will not repay careful study. One interesting point that the author brings out is that so-called cases of "phosphaturia" may in reality be due to chronic prostatitis, and not to any trouble in the urinary tract higher up. This is a fact of distinct importance, and one not generally recognized by the medical profession.

Dr. Taylor's style is excellent, and impresses confidence in the reader; the book is abundantly and admirably illustrated, the illustrations are

among the best we have seen lately in any medical work, and the publishers have on their part put out a book which is altogether pleasing to handle and read.

As the author states in his first chapter, "for a thorough understanding of male sexual disorders more knowledge is required than is generally supposed. In the first place, well-grounded knowledge of general medicine and a general understanding of the anatomy, physiology and pathology of the nervous system are absolutely necessary," etc. We wish these words would be taken to heart by young men, who, on starting practice, think they are competent to be specialists, it matters little in what branch, since this statement is true of all. And for all men who are about to become specialists in genito-urinary diseases we most warmly advocate a careful study of this work.

A Manual of Medical Jurisprudence. By ALFRED SWAINE TAYLOR, M. D., F. R. S. Revised and edited by THOMAS STEVENSON, M. D. Lond. Twelfth American edited, with citations and additions from the twelfth English edition, by CLARK BELL, Esq., LL. D. Lea Brothers & Co., New York and Philadelphia, 1897.

This book has long been considered a standard work, and been in use by the leading medical colleges of the country. It has passed through several editions, of which this is the last, bringing it quite up to date as far as the legal points of view are considered. We do not wish to detract from the value of the work, but we believe it to be time that the book should be re-edited from a medical point of view. After a book has passed through various editions at the hands of different authors it certainly loses some of its original intrinsic value and interest, and one can hardly any longer consider it the work of any one author; but the fact of its long use and the absence of new text-books to take its place shows its permanent value, as long as the name of the author is retained. Since its first production it has been much altered by both lawyers and doctors, and we therefore see no reason why the alteration, as long as it is improvement, should not be thorough. The book is not up to date in its discussion or knowledge of medical topics. The references are old, most of them dating back twenty or thirty years, and if the book is to be really valuable to the physician there should be changes made. Under the heading of criminal abortion, p. 536, we read: "and it has been suggested by Acton that the presence of constitutional syphilis in the father is not only a cause of infection in the offspring, but of repeated abortions in the woman." That is all on syphilis as a cause of abortion—surely it has been more than "suggested"—it has been proven since Acton's time. On p. 711, in discussing the subject of idiocy it is stated that cretinism is accompanied by the enlargement of the thyroid gland; this is certainly not so in the very large majority of cases—there is usually absence of the gland. Again, in this same chapter, dementia is said to be caused by paralysis or hemiplegia; would it not be more proper to say that the same cause which produced paralysis or hemiplegia might, in the end,

entail dementia? These are perhaps all small points in themselves, and we might mention others, but they are sufficient, we think, to establish our claim that the work should be medically revised. In the chapter on impotency, although an attempt is made to draw a difference between this and sterility, yet there are several confusing statements, where one term is misused for the other. We do not approve of the term "neurotic poisons" where is meant poisons which specially attack the nerves; the word "neurotic" has come to be used in such an entirely different sense. One of the most important discoveries of the year 1896 was Florence's Iodine Test for seminal stains; we suppose this appeared too late to be noted by the editor, but to medical jurisprudence it is perhaps the most valuable addition of the last ten years or longer. It is a very delicate and easy test to make, and will undoubtedly be frequently used in medico-legal cases. There is no mention, as far as we have seen, of the use of the Roentgen Rays as evidence in court cases, but perhaps it is too soon to expect this in a work on medical jurisprudence. We believe that in one case already the judge would not allow photographs taken by this process to be used as evidence for or against the plaintiff.

But, after all, one is sometimes led to wonder for whom works on medical jurisprudence are written; we wish that, as far as the lawyers were concerned, they knew nothing of medical matters, their knowledge is ordinarily very superficial and they do not hesitate to use it unfairly. We believe with a good system of appointment of medical experts in all medico-legal cases there would be much less abuse of justice to all parties concerned. We should not see such disgraceful scenes as recently took place in the Leutgert trial in Chicago, nor have medical experts casting the lie, so to speak, in each other's teeth. At present our whole system of carrying on medico-legal trials is bad—the juries are most impressed by the divergence of the opinions of the doctors called by the two sides. We believe there would be no worse mistakes made than are made now, if doctors were not summoned at all. The majority of the medico-legal cases that are brought to trial in this country resemble a farce, as far as the doctors' opinions and testimony are concerned, and a miscarriage of justice as a result of the acts of the lawyers. It were better if doctors could keep out of them entirely, their own reputation—and with them that of the whole profession—would not then be continually lowered.

Correspondence

LETTER FROM DR. WISE.

TO THE EDITOR OF THE AMERICAN JOURNAL OF INSANITY:

In an editorial in the July number of the JOURNAL a reference was made to training schools for nurses in the State Hospitals of New York that gives an impression of niggardly treatment of the trained nurse, by quoting one provision of the official wages schedule, whereby nurses' wages are advanced at the rate of one dollar per month, annually. The schedule provides that attendants, after graduation, shall receive from \$20 to \$28 per month, and shall be designated as nurses, the difference between minimum and maximum depending upon the ward position and time of service; and if men, from \$25 to \$33. The advance of one dollar referred to is an annual increase, but does not represent the increase that occurs when an attendant is transformed to a nurse. As a matter of fact, nurses, when deserving, get rapid promotion, but the above applies to those whose qualities keep them from promotion.

It has not been the desire of the hospitals to retain nurses in the service of the hospital after a full training, else the educational opportunity would be destroyed. A certain number are required as instructors and for the responsible positions, such as charge nurses. If the attraction to the nurse in the hospital was made so great that she would not leave it, the training schools would soon die of inanition. I sincerely hope that the policy of the general hospital will not be refused the special hospital in some degree.

P. M. Wise.

LETTER FROM DR. MOULTON.

TO THE EDITOR OF THE AMERICAN JOURNAL OF INSANITY:

I am familiar with the "boarding-out system" in Massachusetts and with the laws under which it has been administered, and Sir Arthur Mitchell's article in the Boston Medical and Surgical Journal of November 4, 1897, was in many respects most unfair and misleading. In neither the book reviews nor the editorials of the Journal do the writers express the real reasons why the number of insane in private families in Massachusetts does not increase, and your editorial note in the October JOURNAL that "Mr. Sanborn's successors have not seen fit to take an active pushing interest in the work" is in grave error. The insane in Massachusetts were first boarded out in 1885. The number in families on September 30th of each year since has been as follows: 1886, 34; 1887, 73; 1888, 80;

1889, 110; 1890, 148; 1891, 155; 1892, 175; 1893, 164; 1894, 158; 1895, 142; 1896, 129; 1897, 121. It will be noticed that on September 30, under Mr. Sanborn, there were 34, 73 and 80 for the respective years of '86, '87 and '88.

I succeeded Mr. Sanborn in November, 1888, and for the three years following I made every effort to get suitable cases into proper families; and you will observe that the number of boarded-out insane increased to 110, 148 and 155 on September 30th of '89, '90 and '91, not large numbers in themselves, but to one actually acquainted with the facts a most satisfactory showing.

My successor, Dr. Woodbury, who succeeded me in 1891, has labored hard to board out patients, as the above figures prove, and the real reason for the failure of the "system" is truthfully stated in my paper of December 16th, 1897, Boston Medical and Surgical Journal.

There are several other points in the statements of the JOURNAL OF INSANITY which I would like to speak of, but I will refrain from further mention, except to protest against the statement that there have been real enemies in the Board of Lunacy and Charity against the system. I believe the boarded-out-insane system has a place in the treatment of insanity and that it is a most valuable adjunct, and I also know that the Board of Lunacy and Charity of Massachusetts is trying to do that which it believes will be for the best good of its insane and the people of the State. I have never seen evidence of enmity to the boarding-out system on the part of the Board, although some of its members naturally question its success under existing circumstances. The forthcoming report of the Board will contain recommendations which, if acted upon favorably by the Legislature, will make a large field for boarding out insane.

Yours very truly,

A. R. MOULTON.

A Quarterly Bibliography of Psychological Literature

(Extracted, by permission, from the Index Medicus.)

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Obituary

JAMES OLMSTEAD, M. D.

Dr. James Olmstead, superintendent of the Connecticut Hospital for the Insane, died at the Hotel Grenoble, New York City, December 4, 1897, after an illness of about two months, resulting from overwork, exhaustion of vital forces, and mal-assimilation of food. This announcement may signify much or little, according to the point of view. To the world at large it means simply that a public officer, to whom large trusts were confided, has passed away. During his life no one dared to say that he was not honest, devoted and faithful. His constant endeavor was to administer the interests confided to him honestly, economically and faithfully. He felt that he belonged to the State which called him to serve its interests in the administration of a great philanthropic work, and he allowed no private interest to interfere with this high ideal of his duty.

But to his family, his friends, and to those who were intimately associated with him in his life labor, the announcement means much more. It means that the institution, of which he was the honored head, has sustained an irreparable loss. Who but those who were daily associated with him can know fully what a conspicuous illustration of fidelity he was to the large trusts committed to him? Who can know but his co-workers of the keen sense of responsibility he felt for the care of the unfortunate victims of mental disease who were committed to his charge in ever-increasing numbers? No time, no pains, no strength were spared if in any manner he might minister to their comfort, happiness and restoration. We know of the sleepless nights he spent in devising means to care for the increasing multitude of unfortunates for whom adequate accommodations were wanting. His days and nights were freely devoted to the problems which confronted him, and his sole thought was how he might honor-

ably restore his charges to health, home and society. The institution had expanded until it is now one of the largest in the country, and the details of administration had multiplied; yet he gave his personal attention to all its constantly increasing minor operations. He felt that he himself was personally responsible for the success of everything attempted. Not because of his distrust of the abilities of others in comparison with his own, for he was one of the most modest of men I ever knew, but because he loved the work to which his rare native gifts and acquirements were so unselfishly devoted. He could never be prevailed upon to take the rest he so much needed, because he claimed he was happier in his work. He was not so constituted that he was able to shirk the minutest detail. He seemed to fear lest the enterprise so dear to him might suffer were he to leave it, even for a brief space. Apparently he chose with deliberation and with manful resolution to die in harness rather than to sacrifice anything for his own comfort. Although we may claim that he erred in thus shortening his valuable life by overtaxing his powers of endurance, and assert that his gifts and attainments were of too high an order to be thus risked and lost, yet we cannot but admire his noble fidelity to his trust. Nor did he thus devote himself body and soul to his appointed work through any hope of public recognition or desire for self-aggrandizement, but solely from a sense of duty. He gave not only his time and money for the benefit of his patients, but gave himself, his life. Many are the instances where he has relieved the necessities of the needy from his private purse, and no one, even the recipients of his bounty, could discover the source of the benefactions, except in some accidental way. He never gave alms publicly for the sake of applause. Always quiet and unostentatious, he avoided public notice whenever it was possible. He hated shams of all kinds, and deception and equivocation were his special abhorrence. Although modest almost to shyness, he had a moral courage that was sublime where he felt that his duty was concerned. In the presence of a martyrdom to duty like his we must, perforce, bare our heads and say "Thy will be done."

He was a man of scholarly tastes and habit, and every moment that could be spared from the exactions of administrative work found him, book in hand, acquiring such information as he felt

would the better equip him for his life-work and render him more useful as a public servant. His controlling idea under all circumstances seemed to be how he might better subserve the interests of suffering humanity.

Socially, among his friends, Dr. Olmstead was a lovable man. He was thoroughly unselfish and always doing something for the personal comfort or benefit of those who needed it. In the sick room his tenderness and sympathy "surpassed the love of woman."

In the brighter days his merry laugh was contagious, and all nature seemed to smile when he was merry. He was knightly in his courtesy, and take him all in all, we shall not see his like again.

Dr. Olmstead was born in New Haven and was the only son of a well-known druggist of that city. He was educated at Yale University, graduating third in the class of 1872. Upon receiving his academic degree he pursued the study of medicine in the Yale University Medical School, receiving the degree of M. D. from his Alma Mater. He served as interne at the New Haven Hospital, after which he began general practice in the city of his birth. In 1876 he was appointed assistant physician to the Connecticut Hospital for the Insane, and continued as such until the death of Dr. Shew in 1886, when he was called by the Board of Trustees to the superintendency of the institution which he served so long and faithfully.

In 1882 he married Miss Emma Parmerton, daughter of the late John Parmerton, of Derry, N. H., who, with one daughter, still survives him, and was at his bedside when he passed away. For five or six years past he had every summer been prostrated, for a period varying from two to five weeks, by symptoms similar to those which characterized the beginning of his final illness, but from which, after a period of rest and treatment, he had heretofore recovered.

In the illness which finally terminated fatally, his vital forces were apparently too much exhausted for him to rally. A little over two weeks prior to his death he was persuaded to go to New York for much needed rest and treatment, but the change came too late, and despite the most skillful treatment and advice which the city afforded, he sank rapidly, and died December 4.

All that the loving care of a devoted wife and sisters could devise was at his disposal, but to no avail. His burial took place at the Grove Street cemetery in New Haven, December 7, in the presence of his family, several members of the Board of Trustees of the Hospital, prominent State officials, friends, and representatives of the institution with which he had been associated.

H. S. N.

DR. GEORGE ALLEN.

Dr. George Allen, formerly First Assistant Physician at the Middletown State Homeopathic Hospital, at Middletown, N. Y., and more recently Superintendent of the Collins State Homeopathic Hospital, at Collins, N. Y., was born in the town of Poultney, Rutland County, Vermont, September 16, 1853, and died at Gowanda, N. Y., November 14, 1897.

We are obliged to record the early death of one of the most conscientious and faithful workers in the ranks of American psychologists. For twenty years Dr. Allen made a careful and special study of mental and nervous diseases. For more than one year he served as an interne at the Ward's Island General Hospital, where two wards were devoted to the care of the chronic insane. There he made his first studies in alienism. During his twelve years of private practice in Waterville, N. Y., he continued his investigations of the causes and sources of mental diseases. In May, 1890, Dr. Allen accepted a position as First Assistant Physician at the Middletown State institution, and there he wrought zealously, in behalf of the cause which he had espoused, for seven years, when he left to assume the cares and responsibilities of the projected institution at Collins.

Dr. Allen was not only a successful and painstaking physician, but he was likewise a careful and incisive writer. Among the essays which he left as a monument to his literary acumen we may name *Paranoia*, *Circular Insanity*, *The Situation at Middletown* (a dissertation on medical rights), *Some Statistical Facts Concerning Insanity*, and *Phthisis among the Insane*.

Dr. Allen was a quiet, patient, gentle, industrious and conscientious man, and his friends mourn with deep earnestness his early demise; and yet he left to his friends the soul-satisfying record of a life replete with good works in behalf of suffering humanity.

T.

APPEAL FROM THE RUSH MEMORIAL COMMITTEE.

TO THE MEMBERS OF THE MEDICO-PSYCHOLOGICAL ASSOCIATION:

At the recent annual meeting of the American Medico-Psychological Association, the undersigned were appointed a committee to co-operate with a similar committee of the American Medical Association, to urge the completion of the project to erect a memorial at Washington to Dr. Benjamin Rush. Since then the semi-centennial jubilee of the latter body has been held at Philadelphia, and a feature of the occasion was the enthusiastic resolve to raise a fund of *one hundred thousand dollars* for the erection of such a monument as shall be creditable to its illustrious subject and to the great profession of which he was so distinguished a member. This action makes it all the more incumbent upon the American Medico-Psychological Association to contribute its full share to the accomplishment of this commendable national undertaking. Dr. Rush's prominence as an alienist whose views were far ahead of his time, and whose work on insanity was a standard authority in Europe, as well as America, for more than half a century after his death, makes it particularly our duty to honor his memory—first, as one of ourselves and as a master in our special line of inquiry; and, further, because of his eminence as a teacher, writer and general practitioner and renowned Revolutionary patriot.

Your committee, therefore, most earnestly solicits your prompt subscription to the fund, which, it is hoped, you will make commensurate with this Association's estimate of this great physician and psychologist.

Contributions may be made to any member of the committee.

GEORGE H. ROHE, Sykesville, Md.

J. T. SEARCY, Tuscaloosa, Ala.

JOHN CURWEN, Warren, Pa.

BENJ. BLACKFORD, Staunton, Va.

T. J. W. BURGESS, Montreal, Can.

A. B. RICHARDSON, Columbus, Ohio.

WM. M. EDWARDS, Kalamazoo, Mich.

H. A. GILMAN, Mt. Pleasant, Ia.

CHAS. P. BANCROFT, Concord, N. H.

P. M. WISE, Albany, N. Y.



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AMERICAN JOURNAL OF INSANITY

PRISON MEDICAL SERVICE.

BY HAMILTON D. WEY, M. D., ELMIRA, N. Y.,

Physician to the New York State Reformatory.

The increased interest attaching to corrective and punitive institutions, together with the studies made in later years as to crime-causes, and a more general recognition of the fact that punitive measures are of little or no value as deterrents to crime, have brought to notice, incidentally, a study of prison methods and the medical service in connection with institutions of the kind named. As can be readily understood, the duties of such medical officer are many and varied, and comprise much in addition to the routine practice of his profession. In addition to having charge of the hospital and giving ear and attention to the various complaints which are constantly being brought to his notice, the medical officer is held responsible for the general hygiene of the institution. He is supposed to practice preventive medicine as well as to prescribe for actual disease when it occurs; or in other words, in addition to being the medical attendant he exercises the functions of a health officer, and is expected to display that care and surveillance by which epidemics of contagious and infectious diseases may be prevented, or at least that such diseases may be confined within the least possible limits. In matters of medicine and surgery he has made upon him the demands which a general practitioner is called upon to meet, and suddenly, without warning, he may have upon his hands grave cases of surgery and almost the entire range of

ailments comprised within the category of medicine. In connection with the functions already named, he stands between the prisoner and the government, in that allegations of incapacity for this work or that on the part of the inmate are referred to him for his opinion. In this capacity he acts judicially and impersonally, simply considering, so far as the administration is concerned, whether the demands made upon the prisoner are reasonable and just and within his capacity to perform; and on the part of the prisoner, to determine whether he possesses capabilities for the proper and full performance of the task imposed upon him, so far as relates to his mental status, his physical condition, and the absence of disease and deformity. To meet the requirements of his position he must further and necessarily have a practical acquaintance with disorders of the mind and mental disease, that he may be able to decide whether a prisoner be responsible for his acts and amenable to discipline; and on the other hand, whether by reason of his mental status he be a subject for retirement from a penal institution to a hospital for insane criminals.

From the above it will be seen that the demands upon a prison physician are no less varied than those made upon a country practitioner whose ride embraces a broad extent of territory and who is compelled to practice in various lines of his profession. Considering all this, in many instances, under conditions prevailing here and there, the medical service of many institutions is not comprehensive enough, the medical appointment carries with it no professional prerogatives, and the results obtained are not what they should and otherwise would be. The reasons for this are twofold, both as relating to the incumbent of the office and also to the manner of his appointment; and in certain instances the low status accorded him in the institution in which he serves is responsible for a service within narrow lines. It not infrequently happens that the physician, instead of confining himself solely to his legitimate work (of which there is sufficient for occupation and study if he be alive to the responsibilities of his situation and the potentialities it affords for original investigation and research), is called upon to perform duties that are extra-professional and not germane to his calling and office. The mere practice of his profession, that is, the admin-

istration of drugs for this condition or that, the treatment of broken bones, the reduction of luxations in connection with the surgery of emergencies he may be called upon to perform at any moment occupy but a small portion of his time and should constitute but a fraction of the work in which he is engaged. He should, in addition, have a thorough knowledge of the mental condition of the men in the institution, should know that this man is an epileptic, another a neuropath or crank upon the border line, should possess a knowledge of the family history of this man or that, and should recognize the defective along neural lines and the degenerate with perverted tendencies who is as much a menace to himself as others. In order that he may creditably fill his office, and give due expression to his qualifications and a satisfactory performance of his duties, it follows that the most of his time should be required and can be fully taken up along lines already indicated. There are few places which offer a wider field for study and investigation than a penal institution with its vast wealth of material which can be studied under conditions more favorable and with less limitation than in almost any other place. While there are excellent medical men, students, well informed upon matters relating to criminology, who are engaged in prison work, they have not been able to give themselves unreservedly to their prison duties, and the results of their work, in consequence, have not been as great or their contributions to science as frequent as they should be, because the compensation attaching to such an office is not sufficiently great to induce a man who is deriving a good income from his profession to abandon general practice to become the medical officer of a penal institution, with a diminished income, and a knowledge of the fact that almost at any time, with a change of administration or as the result of unforeseen circumstances, he may be called upon to relinquish his place and pass out again into the outer world to commence anew the practice of medicine at the same point practically, as far as patronage is concerned (with the exception of accumulated knowledge), as when, fresh from college, he began his professional career.

The medical officer should have been a general practitioner for a number of years prior to entering upon prison work, not less than three years, five perhaps would be better, and his prac-

tice should have been of such a kind as to have brought him in contact with "all sorts and conditions of men," and conferred a knowledge of various social classes. Moreover, as he will be called upon from time to time to decide the question of the mental responsibility of a given person and his amenability or otherwise to discipline, it is incumbent that he bring to the performance of his duties a practical knowledge of insanity and of various morbid mental phenomena. To this end he should have had an actual experience in a hospital for the insane sufficiently long to enable him to acquire a knowledge of the various forms of insanity and to differentiate, with reasonable accuracy, fictitious mental disease. Further than this, he should have made a study of epilepsy, its immediate and remote effects, so that he may be able, in a given case, when called upon to determine whether alleged epileptic seizures are genuine or fictitious; and if the former, whether disqualification for certain duties exists, whether relating to mental operations or confined to handicraft alone. A change in physiognomy, in manner, or in the performance of task suggests to the medical officer mental change or impairment long before symptoms become so pronounced and unmistakable that the same are recognized and noted by non-professional observers. The withdrawal of such a man from the routine of prison life, an assignment to the hospital where, under better hygiene, more comfortable quarters, better nourishment, he can be under constant observation that perchance the symptoms of nervous disturbance may subside, or other manifestations of mental disease developing themselves may establish beyond all doubt the fact that the prisoner in question is a more suitable subject for a hospital for the insane of his class than for a correctional institution and its disciplinary regulations. No penal institution should attempt to care for, within its walls, those who become insane during incarceration; and the administration which countenances and the physician who attempts to treat in a prison hospital cases of insanity are assuming grave responsibility in undertaking to do what in the very order of events they have not the facilities for carrying out. All newcomers should be examined as soon after admission as possible, that a knowledge be gained of the state of mind of each individual, the mental peculiarities noted, as by so doing persons will fre-

quently be discovered who are scarcely amenable to prison discipline and who, if their mental condition had been taken cognizance of by the justice who passed sentence, would in all probability have either been discharged or held for examination as to condition of mind and consigned elsewhere than to a prison. And what has just been said equally applies to epileptics. It is surprising how many epileptics of low mental status are tried and sentenced who are scarcely responsible for their acts and whose counsel would have raised the plea of insanity due to epilepsy as a defense had the offense been a capital one instead of some trivial act against person or property, the magnitude of which was barely sufficient to constitute it a felony. Within the writer's experience there is not one case called to mind in which in felonies of a low order the plea of unsoundness of mind due to epilepsy or a post-epileptic condition has ever been raised as a defense; and he is acquainted with a number of instances in which such a defense might very properly have been made. A prison is an unfit and improper place for an epileptic, so far as concerns himself and his influence upon the prison at large. He cannot be held to the same responsibility and discipline as other prisoners by reason of his condition and the irritability of mind which may precede or follow an epileptic seizure. These facts are known and operate to produce a bad effect upon others. A few epileptics distributed here and there through a prison, having convulsions in the yard and shop, offer a suggestion to designing prisoners, from which they take a cue. The latter, being good observers, often succeed in having convulsions attended by the usual objective manifestations, which may, for a time at least, occasion the disciplinary officers trouble because of their inability to differentiate between disease and a fictitious manifestation of the same, while the physician is not always at hand to witness the explosion. The treatment of this unfortunate class demands that they be treated beyond prison walls under such conditions as will ensure their safety, provide for them work of such kinds as they are able to do—preferably out of doors—amid such surroundings as create interest in the work in hand, with a proper dietary, and under such restrictions as will prevent a repetition of their criminal acts.

As previously stated, the physician, as a qualification for office, should have been a general practitioner of medicine (or have had

a general hospital experience), and have been connected with a hospital for the insane before becoming eligible for appointment. In addition to this the status of his office should be so determined by law that in his department, in the performance of his direct and collateral duties, he may not be hampered or embarrassed by directors or heads of other departments, nor should a warden set his non-professional opinion against that of the medical officer in purely professional matters. It is inferred at least that having the status of this office definitely determined by statute will not interfere with the basic law governing the institution, and that the latter in its framing was not formed to conflict with the former. As it is as much the province of the physician to prevent disease as it is to cure, his recommendations made from time to time and based upon his actual knowledge of sanitary conditions prevailing throughout the institution, should receive prompt recognition in the correction of those evils of which he complains. A negligence or oversight on the part of the medical officer might easily cripple a prison through the advent of an epidemic of contagious disease and a consequent which might have been avoided through the alertness of the medical officer and the necessary support accorded him. He should not be called upon to perform other than professional duties. If the institution is one of any size opportunities for work will not be wanting, and he will have his time fully occupied if interested in his calling and studious. Indeed it is a question if the performance of extraneous duties be not derogatory to the dignity of a medical officer and impair his usefulness in professional lines. The picture of a physician in charge of a bureau of identification—taking weights and measures of prisoners upon admission and discharge, conducting a photograph gallery, and actively engaged in other lines, all of which duties could have been as acceptably performed by an employee at \$35 to \$40 per month and found, has long been carried in mind. For the proper keeping of hospital and other records the physician should be supplied with such clerical aid that his books may be fully and properly kept.

It is a matter of surprise and regret to note in widely separated places, scattered here and there throughout the country, especially in prisons of old construction, the hospital seems to have been an after-thought and this important department placed in

an obscure corner, ill-supplied with proper facilities and oftentimes, from a sanitary point of view, poorly adapted for the reception of the sick. The results obtained in such a hospital do not equal what might have been had the apartments contained more fresh air and sunshine, and furniture more comfortable and pleasing to the eye, together with better food served in a more attractive manner. The functions of a prison hospital in the treatment of manifest disease are only equalled by the opportunities it affords for the study of those inmates concerning whose sanity or nervous stability there is question. In the quietude of the hospital, withdrawn from the inflexible discipline of every-day life in the ranks, and in response to gentler amenities than characterize ordinary prison life, it is often possible to arrive at a recognition of mental defects and ill-defined delusions, or to plot upon the borderland the standing of a neuropath who from time to time has recurring nervous explosions. These can be much better studied in the prison hospital than in a cell, in which latter place delusions are oftentimes concealed and nervous manifestations are mistaken for surliness and sulks until such a time as they find expression in perhaps an aggravated assault and where, after violence has been committed, by a process of retrospection a diagnosis of insanity may be arrived at.

No good results can be expected, nor can a man be found for the position of prison physician, willing to devote his entire time to the work, while the tenure of office is uncertain and where, as in certain States, a change in the personnel of heads of departments in public institutions is dependent upon a yearly change of administration. In order to secure a medical man possessing the requisite qualifications it is necessary that he should know that his tenure of office depends upon something more than a recurring political upheaval. Just as he has succeeded in organizing his department upon a scientific basis, and has become thoroughly interested in his work, acquiring in some instances a general and in others a special knowledge of the men under him, so that he is broadly acquainted with personal peculiarities and idiosyncrasies, he should not be called upon to "resign" his office and retire in order to make way for one who stands in favor with an incoming administration and whose points of recommendation are his activities in behalf of the party in power.

A STUDY OF THE EXCRETION OF UREA AND URIC ACID IN MELANCHOLIA AND IN A CASE PRESENTING RECURRENT PERIODS OF CONFUSION AND DEPRESSION.

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This study of urea and uric acid excretion in melancholia is based upon work that was carried on in the McLean Hospital Laboratory during the years from 1891 to 1895.¹

Historical Review.—A short review of the literature of this subject will give some idea of the work done by others and the results obtained. In this résumé attention is paid only to the amount of urine, specific gravity, urea and uric acid in melancholia.

Sutherland and Rigby² as long ago as 1845 state that the specific gravity of the urine in the insane ranges mostly between 1021 and 1030, and frequently exceeds 1030. They were also among the first, if not the earliest, to make observations on the urea and uric acid in the insane. In 40 cases of melancholia urea and uric acid were increased in 19.

¹ The chemical work was performed under the direction of the pathologist, Dr. Wm. Noyes, with the assistance of the medical internes, Drs. W. F. Sawyer, Follen Cabot, and C. B. Stevens, till February, 1893, when Dr. Noyes resigned. From July, 1893, to July, 1895, this laboratory work was done by the internes, Dr. H. P. Lovewell, and the writer; the latter during the first and last six months, and the former during the intervening year. Dr. Lovewell and the writer originally intended to bring these results together, but circumstances preventing, the former has kindly allowed the latter to use his analyses.

² Reviewed in *Allgemeine Zeitschrift f. Psychiatrie*, Bd. 3, 1846, p. 56.

Voppel,* on the other hand, found the urea diminished in the insane.

Selin[†] observes in melancholia that the quantity of urine, solids, urea and uric acid are diminished in the period of an aggravation of the symptoms.

Addison[‡] concludes that the quantity of urine and urea, during the course of the "maniacal paroxysms" in melancholia, is less than the amounts excreted in an equal time in health; in chronic melancholia they are reduced below the mean, and sometimes to the minimum, of health.

Rabow[§] observes that the quantity of urine is markedly diminished, as is the urea, to a less extent, while the specific gravity is increased. In two cases of circular insanity he obtained the following results:

	CASE I.		CASE II.	
	Depression.	Exhilaration.	Depression.	Exhilaration.
Amt. in cc.....	500	1180	600	1900
Sp. Gr.....	1020	1018	1021	1014
Solids.....	28	85	29.4	62.7
Urea.....	12.8	18.5	14	30

Case I ate well during exhilaration and gradually gained 40 pounds. No note is made concerning food in Case II.

Lombroso speaks of both the specific gravity[¶] and the urea[¶] as being diminished.

Schäfer[¶] studied the amount and the specific gravity of the urine in a case of circular insanity through two cycles. Below

* Reissner in a review of V.'s work (*Allg. Zeit. f. Psych.*, Bd. 19, 1862, p. 500), says that the method used is bad, and that with it it is possible to find an absence of urea, which actually occurred. The same review criticises severely the results obtained by Sutherland and Rigby.

[†] Abstract in *Allg. Zeit. f. Psych.*, Bd. 20, 1863, p. 600.

[‡] "On the Urine of the Insane," Abstract in *Journ. of Ment. Science*, vol. 11, 1865, p. 262.

[§] *Beitrag zur Kenntniss der Beschaffenheit des Harns bei Geisteskranken. Arch. f. Psych.*, Bd. 7, 1877, p. 62.

[¶] Quoted in Krafft-Ebing's *Lehrbuch der Psychiatrie*, 5th Ed., 1893, p. 137.

[¶] Quoted by Rabow, loc. cit. p. 64.

[¶] Ein Fall von circulärer Geistesstörung. *Neurolog. Centralblatt*, Bd. I, p. 201.

is the average of his results, to which are appended the calculated solids.²⁰

	CASE I.		CASE II.	
	Depression.	Exhilaration.	Depression.	Exhilaration.
Amt. in cc.....	786	1850	500	1845
Sp. Gr.....	1081.7	1023.7	1082.7	1023.8
Solids.....	54.9	103.4	38.4	75.3

Lange,²¹ of Copenhagen, connects mental depression and the uric acid diathesis, and on that basis he claims to treat this depression successfully by a diminution of meat diet and certain rules as to exercise.

Smyth²² finds that the urea excreted in melancholia is almost equal to that in health. Uric acid is increased. He used Haycraft's method for uric acid, which, according to many observers, is faulty and regularly gives high results.²³ Again, his figures hardly seem to justify the above conclusion concerning uric acid, since he obtained 1.8 of uric acid in melancholia, and the same amount in his second series of healthy men; however, it is true if we compare only his normal series, which is 0.9 (page 517).

Mabille and Lallemand²⁴ claim that in those cases of insanity in which the ascendants suffer from gout, arthritis, and diabetes, or in which the patient is subject to a diathesis himself, they find an increase of uric acid over urea. These cases are sometimes mania, but mostly melancholia. They have periods of remission, in which they seem well. Their urine is dense, the nitrogen is diminished, and the uric acid is sometimes normal and sometimes greatly diminished.

One of the articles which called attention to the possible connection of uric acid and some forms of mental disease and which led to the carrying out of these observations as tests of such relationship, was a paper by Haig, which appeared in the spring

²⁰ After Häser's method.

²¹ Quoted by Haig in *Brain*, vol. 14, 1891, p. 74.

²² An Inquiry into the Blood and Urine of the Insane, *Journ. of Ment. Sci.*, vol. 36, 1890, p. 504.

²³ Hermann, Czapek, Herter and Smith, Salkowski, Hammerton, and others.

²⁴ Quoted by Régis and Chevalier-Lavaure in *Des Auto-Intoxications dans les Maladies Mentales. Congrès des Médecins Alienistes des Pays de Langue Française*, La Rochelle, 1893, p. 13.

number of *Brain*, 1891, on "Uric Acid in Diseases of the Nervous System." The part which is of interest to us here is that which has to do with mental depression. On page 68 he says: "For in addition to my own experience that mental depression accompanied the uric acid headache, it was observed by myself and others that the period of headache and mental depression was often closely preceded by a period of mental exaltation and well-being, but I have mentioned above that the excretion of uric acid is diminished before the headache; therefore the mental condition varies directly with the relative amount of uric acid in the urine, and I was not long in putting this point to the same tests I had used in the case of headache, and I published a paper on 'Mental Depression and the Excretion of Uric Acid' in the *Practitioner*, November, 1888." The communication last referred to consists mostly of a theoretical discussion of uric acid as being a probable cause in some cases of temporary depression, the writer giving as the basis for such a conclusion the analysis of his own urine with that of a few other cases. He found an increased amount of uric acid in relation to urea, and from this he drew the above conclusion. However, it is just to Haig to say that he remarks, "when depression lasts for days and weeks without intermission, it is probably not due to uric acid." The *modus operandi* of the uric acid in producing mental depression is, according to Haig, by contracting the blood-vessels in the brain.¹⁶ The value of Haig's work as a whole is lowered, since, as said above, "there is a doubt as to the applicability of Haycraft's method to urine."¹⁷ Again, one can hardly help being skeptical of an hypothesis which tries to explain everything by uric-acidaemia, from Raynaud's disease¹⁸ to the "bias of women towards religion."¹⁹

Marzocchi's²⁰ conclusions are as follows: "(1) In some forms

¹⁶ *Brain*, XIV, p. 81.

¹⁷ Halliburton, *Text-Book of Chemical Physiology and Pathology*, 1890, p. 808.

¹⁸ *Uric Acid*, 2d ed., 1894, p. 201.

¹⁹ *Idem*, p. 154.

²⁰ Marzocchi, *L'Acido Urico nelle Forme di Depressione Mentale. Rivista Sperimentale di Freniatria e di Medicina Legale*, 1892, vol. XVIII, Fascic. II, p. 330.

of melancholia there occurs an increase, absolute and relative, of the uric acid in the blood. (2) It is not probable that such an increase is a simple effect of the morbid process, on account of the depressive influence on the psychical functions of the uric acid." (3) Even if one does not wish to give to uric acid the value of a factor, one can consider it the cause of an aggravation of the morbid process." When an inquiry is made as to how he arrived at such a conclusion these objections seem patent: (a) The 24-hour amount of urine was not used. This is of vital importance, since there is physiologically a great variation at different times of the day." (b) Observations are too few—only 18—which are divided between 7 cases. (c) His method (Heintz's) is notoriously unreliable. (d) The statement as to the uric acid in the blood is assumed on the basis of urinary tests.

Babcock²⁸ finds that the specific gravity is above normal. He also speaks of the excess of urates, using only the murexid test, which is too rough to base any conclusions on.

Régis²⁹ says that urea is sometimes below the normal in melancholia.

Dagonet³⁰ remarks that the amounts of urine and urea are diminished in the depression, especially in melancholia.

Stefani,³¹ in analyses of 60 cases, some of which extended over several months, observes: "In acute psychoses with a short course there is a decided increase in the specific gravity (1040 and more), which diminishes with convalescence, and rises again with a relapse in the condition. In some cases the curve of the specific gravity showed such a parallelism with the course of the disease that it could be compared to the temperature curves of

²⁸ He assumes that Haig has proved that uric acid causes mental depression.

²⁹ Sir W. Roberts, *On the Daily Change of the Urine*, Edinburgh Medical Journal, vol. V, 1860, pp. 817 and 906.

³⁰ A Study of the Urinalyses of 110 Cases of Insanity, *Med. & Surg. Rep. (Phil.)*, vol. LXXX, 1894, p. 126.

³¹ *Practical Manual of Mental Medicine*, translated by H. M. Bannister, M. D., p. 102. Utica, N. Y., 1894.

³² *Traité des Maladies Mentales*, p. 101. Paris, 1894.

³³ Sul peso specifico dell'orina nelle malattie mentali. *Rivista Sperimentale di Freniatria e di Medicina Legale*, vol. XX, Fascic. I, 1894, p. 1.

some acute disease. When a disease became chronic the specific gravity fell to normal after irregular oscillations. The body weight in most cases varied inversely with the specific gravity."

Summary of the conclusions of others.—In melancholia all agree that the amount of urine is diminished; and all, excepting Lombroso, that the specific gravity is increased. Urea is found lessened by eight out of ten observers. Uric acid was studied by four writers; an absolute increase was reported by two,* the other two obtain it at times above, and then again below normal. Besides these four, two claim that the uric acid is increased in relation to urea.

The methods used were those recommended by Professors E. S. Wood and W. B. Hills, of Harvard Medical School, as the tests that were practicable and at the same time trustworthy. These have been used throughout the entire observations, no change being made for newer and perhaps more accurate methods, since it was desirable to have the whole work comparable with itself.

Urea.—The hypobromite method for urea was used by means of the instrument devised by Doremus[†] of New York. This is a very simple and easily performed test. Although the result is only approximate, the error is small, and it answers the purpose very well, inasmuch as the urea is in comparatively large amounts. In some experiments as to its accuracy with known solutions of urea I find that the calculated amount is rather less than it should be, namely, an average difference of less than 8 per cent.[‡] This is a constant error in all the observations, so that the results are comparable with themselves, and the figures given are those obtained by this method uncorrected. This change would lower somewhat the ratio of uric acid to urea.

* Smyth, Sutherland and Rigby. The same men are the only ones who find urea increased.

† C. W. Purdy, *Practical Urinalysis and Urinary Diagnosis*. 1894, p. 28.

‡ Parallel tests with this method give practically the same results, frequently giving the same amount. The probable error, due to technique, of this method is less than five per cent. It should be added that very often two tests were made, and if there was any difference, the mean was taken.

Uric Acid.—For the analysis of uric acid Salkowski's modification of Fokker's method was used.*

Pott[†] made comparative tests in 3 pathological and in 5 healthy cases with the above method, and with Ludwig-Salkowski silver method, and found in the greatest variation a difference of not more than — 3.17 per cent. to + 3.03 per cent.

The accuracy of this method was tested by doing parallels on eleven different urines—see Table No. 1—with the result of an average difference of 0.0052 grm., and a maximum difference of 0.0138 in 200 cc., and an average of 0.0307, and a maximum of 0.0993 in the 24-hours amount. This makes an average difference in the ratio of uric acid to urea of less than 2, and a maximum of 4. So that the probable error due to variation in the technique of the method itself is ± 4 per cent. (i. e., the average difference in 200 cc.—0.0052—divided by the average amount of uric acid in 200 cc.—0.1293—equals 4 per cent.

Some difficulty was encountered at the beginning of these studies in collecting the urine of some of the female patients—some being lost with the faeces. This was overcome by the use of a chair devised by Dr. Cowles, which had two apartments and was so adjusted that it divided the perineum. In this manner no urine was lost. The chair was used in the cases under observation whenever it was necessary.

* It is as follows: 200 cc. of urine made strongly alkaline by adding about 10 cc. of a saturated solution of sodium carbonate. To this 20 cc. of saturated solution of ammonium chloride is added after an hour. The mixture is then put in a refrigerator for 48 hours, the precipitate is collected on a weighed filter, and is then washed once with distilled water. After this the end of the funnel is corked, and dilute hydrochloric acid (1 to 10) is allowed to stand in the filter for 6 hours or more. The cork is removed and the filter is washed once with distilled water, then with alcohol, till all acid reaction disappears. The filter is allowed to dry for two or three days at the room temperature and is then weighed. To the difference in weight of the estimated uric acid, 0.03 gram is added. This gives the uric acid in 200 cc. of the urine, and from this the total uric acid is calculated. (Halliburton, Text-book of Chem. and Phys. Path., p. 808, 1890.)

† Neubauer und Vogel, *Analyse des Harns*, Neunte Auflage, 1890, p. 545.

PARALLEL OBSERVATIONS ON URIC ACID.

No.	Case.	Date.	Amount in 24 hours.	Urea.	Uric Acid.		Ratio. $\frac{U}{U:U}$	Difference in 24 hours. Amount.	Difference in 240 cc.	Difference in Ratio.
					In 240 cc.	Total.				
1	Mr. B. H.	Nov. 8.	800	29.60	.1320	.4880	1: 61	.0088	.0023	2
2	" "	" "	"	"	.1343	.4908	1: 59			
3	" "	Nov. 10.	600	17.40	.2743	.8236	1: 21	.0297	.0099	1
4	" "	" "	"	"	.2841	.8523	1: 20			
5	" "	Nov. 13.	1470	20.81	.1430	1.0510	1: 27	.0759	.0103	2
6	" "	" "	"	"	.1328	.9761	1: 29			
7	" "	Nov. 15.	1800	30.78	.0944	.8496	1: 36	.0171	.0019	1
8	" "	" "	"	"	.0925	.8325	1: 37			
9	" "	Nov. 17.	880	13.85	.1535	.6754	1: 20	.0066	.0015	0
10	" "	" "	"	"	.1320	.6688	1: 20			
11	" "	Nov. 19.	1440	18.72	.1188	.8553	1: 32	.0098	.0138	4
12	" "	" "	"	"	.1050	.7560	1: 26			
13	Mrs. L. H.	Nov. 9.	970	18.43	.1008	.4888	1: 38	.0006	.0001	0
14	" "	" "	"	"	.1009	.4894	1: 37			
15	" "	Nov. 11.	1300	26.76	.1108	.6643	1: 40	.0420	.0070	3
16	" "	" "	"	"	.1088	.6228	1: 43			
17	" "	Nov. 12.	1060	20.14	.1143	.6055	1: 33	.0158	.0080	1
18	" "	" "	"	"	.1113	.5500	1: 34			
19	" "	Nov. 14.	1020	17.95	.0924	.5099	1: 35	.0205	.0057	2
20	" "	" "	"	"	.0987	.4774	1: 37			
21	" "	Nov. 16.	1200	23.04	.1132	.6792	1: 34	.0120	.0020	0
22	" "	" "	"	"	.1112	.6672	1: 34			
Averages....		....	....	....	.1298	....	....	.0307	.0052	1.4

NORMAL URINES OF MALES.

No.	Date.	Amt. of Ur.	Spec. Gr.	Solids.	Urea.	Uric Acidd.	$\frac{-}{U} : \frac{+}{U}$
1	Sept. 11/98	1008	1.027	64.55	28.52	0.6811	1 : 35
2	Oct. 27/98	1500	1.014	49.40	27.31	0.7553	1 : 36
3	Oct. 10/98	870	1.025	50.55	25.07	0.6860	1 : 36
4	" "	852	1.028	55.98	25.39	0.6915	1 : 37
5	Oct. 24/94	1686	....	....	31.64	1.0259	1 : 31
6	Dec. 11/94	1050	1.026	63.61	31.50	1.0673	1 : 29
7	Dec. 17/94	1120	1.027	70.46	30.69	1.0618	1 : 29
8	Dec. 21/94	1400	1.027	88.07	38.64	0.9520	1 : 40
9	" "	1240	1.021	60.07	22.32	0.8227	1 : 27
10	Dec. 22/94	1380	1.023	73.95	37.26	1.1026	1 : 34
Average.....		1211	1.024	64.07	29.33	0.8846	1 : 33

NORMAL URINES OF FEMALES.

1	Dec. 21/94	980	1.021	47.95	25.48	0.5464	1 : 47
2	" "	880	1.026	53.31	23.76	1.0292	1 : 23
3	" "	1440	1.013	43.62	16.99	0.4860	1 : 35
4	Dec. 23/94	930	1.026	56.34	18.41	0.6677	1 : 28
5	Dec. 24/94	730	1.036	54.23	24.01	0.7702	1 : 31
6	Jan. 1/95	1080	1.015	35.23	32.94	0.8866	1 : 37
7	" "	940	1.020	43.80	19.83	0.7195	1 : 28
8	" "	1130	1.021	55.29	21.47	0.6910	1 : 31
9	" "	660	1.031	47.67	18.81	0.6042	1 : 31
10	" "	1043	1.023	45.33	24.94	0.7249	1 : 34
Average.....		981	1.023	52.57	22.77	0.7136	1 : 32

Table II gives the analysis of 20 normal urines of 10 male and of 10 female individuals.

The results obtained are practically the same as those of other observers,^a the females giving lower results, which is what has been found by those who have investigated this question. It should be added that some of the latter urines were obtained from nurses who were doing night duty, and that many eat a smaller amount of food under these circumstances than they would otherwise; so we may say that our normal for women is rather low. The ratio of uric acid in healthy men is between 1:27 to 1:40; in women between 1:23 to 1:47; while the averages are 1:33 and 1:32, or when corrected, for the constant lessened amount of urea 1:36 and 1:35, respectively, for men and women. Although this is a somewhat higher ratio than some observers find, yet we feel that a comparison of the result obtained in melancholia with this normal is justifiable, and will not give faulty conclusions, since both the normal and the cases re-

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Observers.	MEN.			WOMEN.		
	Urea.	Uric Acid.	$\frac{-}{U} : \frac{+}{U}$	Urea.	Uric Acid.	$\frac{-}{U} : \frac{+}{U}$
Yvon and Berlioz*....	26.52	0.596	1 : 44	20.61	0.556	1 : 37
Mosler*.....	36.20	..	..	25.79		
Parkeſt.....	34.00	..	..	26.00		
Camerer†.....	..	..	1 : 81			
Waller‡.....	80.00	0.750	1 : 40			
Herter and Smith|....	25. to 40.	0.50 to 0.75	1:45 to 1:65			
Vogel*.....	35.00	0.75	1 : 45			
Kerner*.....	38.00	0.94	1 : 40			
Haig¶.....	..	..	1 : 35			

* H. Vierordt, *Daten und Tabellen für Mediciner*, Zweite Auflage, 1893, pp. 222 and 223.

† Quoted by Addison, *Journal of Mental Science*, vol. XI, 1865, p. 264.

‡ Neubauer und Vogel, *Analyse des Harns*, Neunte Auflage, Zweiter Theil, 1890, p. 239.

§ *Human Physiology*, 1891, p. 227.

| *N. Y. Medical Journal*, June 4th, 1892.

¶ *Uric Acid*, 2nd ed., 1894.

ported here were done by the same method, and whatever errors may be present are common.

Von Noorden, in his book, *Pathologie des Stoffwechsels*,²² has called attention to the great variation between the uric acid and the total nitrogen in the urine of healthy persons, and to the fact that individuals seem to have a ratio peculiar to themselves, which is remarkably persistent in its constancy in the same person under various dietary conditions; and, again, that on the whole the ratio decreases as the total nitrogen increases.

In the following pages the results of some thousand analyses of urine in ten different cases of melancholia are given. Attention is paid to the amount of urine and solids, to the specific gravity, but more particularly to the amount of urea and uric acid secreted, to the ratio between these two constituents, and when it was possible, to the relation which existed between the approximate nitrogen intake and the nitrogen output.

Case I. L. A. H. Female, aged 67. Admitted to McLean Hospital January 31, 1892. No heredity. Had an attack of melancholia at 45; recovered after several months. This illness was soon after the death of her husband. In the 22 years since, she has had a number of light and short attacks, and it has been customary for her to be depressed each spring. Condition on admission: thinks she is a very wicked woman, has committed the unpardonable sin, and that she is about to die an awful death. During March she became extremely agitated; would bite her arms and hands. In April became more comfortable, and at the end of the month had given up some of her delusions. During May continued to improve steadily till she was well mentally. Went home June 1, "recovered."

Second admission July 13, 1893. Was well during the past year, excepting a period of depression of a week in the spring. This attack began with sleeplessness and indigestion; afraid she will injure herself. Thinks she is possessed with the devil. During July she grew gradually worse, and in August and September she was much agitated, biting her arms; suicidal. She then improved some and became worse again in February. From then on she improved to a certain point, where she could control herself more, but the delusion still continued.

Discussion.—First attack. The amount of urine during the whole observation was not abnormal. The solids varied but little, and were practically normal. The urea was low, but rose from 14.8 to 18.5. The uric acid was within normal limits, falling

²² Berlin, 1893, p. 54.

from 0.65 to 0.56. The ratio of uric acid to urea varied from 1:23 to 1:33. She gained in the first month under observation $4\frac{1}{2}$ pounds, and then the weight remained stationary.

The above results seem as if there was some relation between the course of the disease and the amount of uric acid, and the ratio between it and urea, for as the ratio became less the patient improved, yet the amount of uric acid was never outside of the normal.

Second attack. The tables below give a condensation of 500 observations by monthly periods, and the notes in this case will be in reference to those periods, since the daily chart is so long that it is confusing to follow it.

The amount of urine varied between 720 and 1178 cc., averaging 952. The solids during the first four months were about 39; from November, 1893, to January, 1894, about 50; from then to August, 35; from this date to the end of the observations, near 40; averaging for the whole time 40. The urea throughout is diminished, averaging only 16; from July, 1893, to November, 1893, there was a gradual rise to 24. In October, November and December she was better. This was followed by a gradual fall to 13.60 in February, 1894, when she was worse. From then to the end the urea varied between that figure and 16.10. The uric acid averaged 0.50, and varied little from this. The ratio of uric acid to urea for the whole series is 1:32. The variation in the ratio corresponds, for the most part, with the change in the urea curve. From 1:27 at the beginning it fell to 1:45 in December, 1893, rising during the next three months to 1:30. It fell again to 1:34 in April and May, 1893, then gradually rising to 1:25.

In some cases records of the diet are kept in this hospital. This is done by putting down the number of slices of bread, the number of ounces of milk, and as nearly as possible the quantity of the various other articles of diet. Having such data in five of our cases, estimates of the proteids were made on the assumption that in a hospital like this, where the same person serves the food, about the same amount of oatmeal would be contained in a dish, that a slice of bread, etc., would weigh about the same from day to day, so that by finding out what an average piece of meat weighed as served in the ward, and so on throughout the dietary, it would be possible to obtain a rough approximate value

of the amount of food a patient received each day. Then by calculating the proteids in each article of food, according to the tables of Prof. W. O. Atwater,* the daily amount of proteid taken was obtained, of course very approximately.

The proteids were calculated for 7 months from the beginning. They rose during the first four months from 60 to 119; then fell to 91 in the next three months, averaging for the whole period 94. It is to be regretted that the diet was not kept throughout 1894. However, the nurse reports that the patient ate about the same as in 1893. The body weight varied little from that on admission, and bore no relation to the intensity of the disease. The percentage of urea to proteid fell from 23 on admission to 16 in October, 1893, which is decidedly low. This is very interesting, inasmuch as she grew worse from the beginning, and during August and September was very ill mentally. In the following four months she was somewhat better, and the percentage rose to 22, 21 and 19. The patient ate for the most part very well, say 94 grams of proteid, and with that excreted very little nitrogenous matter, hence giving the low percentage above referred to.

The apparent relation between uric acid and the disease in the first attack is not seen in the second, since this element varied little, and not at all with the mental condition. However, the question of the relation of mental depression was thoroughly studied on a daily chart with negative results. It is curious that from the beginning up to December, 1893, the ratio of uric acid fell, and that she had reached a stage of improvement at this date from which there has been little change.

Case II. C. A. M. Admitted October 13, 1892. Aged 29. A woman of a nervous disposition, prone to worry. The death of a child in August, 1890, caused uncontrollable grief. The death of another child in November, 1890, was followed by "nervous depression." In July, 1892, she began to worry about impending danger; suspicious, and suicidal in talk. A week before her confinement, in August, she became much agitated. After delivery she was better. Hallucinations of varying character continued. A week before entrance she attempted suicide. During the rest of October she was not restless, but depressed, and ate well. In November took more notice of things. At times thought she was taking the sacrament when

* See Appleton's Annual Cyclopedia, 1881, vol. 6, p. 670. Same, 1883, vol. 8, p. 342.

she ate. The depression was less in December, and she would voluntarily begin conversation, but still had delusions about food. Discharged in March "much improved." Body weight October 14, 90 pounds, November 1, 93 pounds, and December 1, 100 pounds.

Discussion.—The amount of urine varies considerably, averaging 993 cc.; however, there is a tendency to increase some from the beginning to a higher level. The solids on the whole are diminished, the average being 39.38, yet at times the solids are normal. During the first half they are 34.9, and the last 40.7. The urea varies also considerably, averaging 17.88, which is decidedly low. In the first part it averaged 16.8, and the last 18.5. The uric acid, on the whole, follows the urea, the average being 0.47. The ratio of uric acid to urea varies between wide limits, being on an average 1 : 39. The proteids are fairly constant, changing little from the average: 89. The average percentage of urea to proteid taken in is 19. During the observation she gained 10 pounds, which may explain in part the low nitrogenous excretion, some of the proteid being stored up as body albumin, since she was in a debilitated condition on entrance. As the patient improved, the urea increased slightly, and the percentage of urea to proteid rose from 18.7 in the first half of the observation to 20.3 in the second half.

Case III. E. D. C. Female, aged 36. Admitted January 16, 1892. Some insanity in mother's family. She always had fair health; normal weight 112 to 125. In summer 1891 she lost considerable sleep on account of sickness in family, and worried a great deal. In August she was confined and nursed the baby for two months, became somewhat exhausted and depressed, having "gastric weakness," insomnia, and in September was apprehensive and agitated at times. She was brought to the hospital for fear of suicide. From January to August she was depressed, suffering at times from paraesthesia in limbs and pain in back and hips. During the later part of this period she became less depressed. This gradual improvement continued throughout the observations. In the spring following she became for a while rather more depressed. From May on she gained considerably, and by the end of July was discharged recovered. This is a case of rather mild melancholia, which made a slow recovery. The urinary analyses were made from October, 1892, to January, 1893.

Discussion.—The amount of urine is normal, averaging 1305 cc. And it also varies within normal limits and had a tendency to fall from August to the end of December. The specific gravity averages only 1014, and as a consequence the solids are low and they

vary comparatively little. The urea varies little, the average being 21.54. The uric acid follows roughly the urea. The average is 0.58. Both the urea and uric acid approach near our normal for women, which was said to be rather low. The ratio of uric acid to urea varies within somewhat wide limits; the average being 1:37. It shows a tendency to fall slightly in the latter half of the observations when improving. The proteid taken in is very constant, varying slightly from the average: 93. The percentage of urea to proteid consumed is 22 per cent. on an average, with a slight tendency to rise during the last half of the observation. The body weight varies only from 154 to 159 from August to January. In this case of mild melancholia in an individual having rather more adipose tissue than is normal to her, we find no marked change in the excretion of the urine in quantity, solids, urea and uric acid, although it is true that the last three elements are a little below the average normal. The comparison of the nitrogenous elimination with the proteid consumption shows the same phenomena as in Cases I and II to a less degree; namely, the percentage between the intake and output of nitrogen is 22 per cent.

Case IV. C. M. H. Female, aged 54. Admitted October 27, 1892. In the spring of 1891 she had neuralgia and dyspepsia. She was confined to bed for a time. She was better in October, 1891. She attempted suicide last January. She has been resistive and obstinate, wants to stay in a dark room; is easily disturbed; depressed. During the first month she slept little, three to four hours, and was in a hopeless state of mind, fearing that she would never get well, sitting up only a few hours a day. When under observation she remained about the same, doing only what was agreeable to her, making no effort to help herself, sleeping usually about four hours a night. About the middle of April she showed signs of improvement, so that by May 12 she went home. Weight 87 pounds on admission. From December to May weight varied between 91 and 93.

Discussion.—The amount of urine varies within quite wide limits, but is low, averaging 714 cc. The specific gravity averages 1022. The solids are diminished, the average being 36.38. The urea is, on the whole, diminished, being 15.88. There are periods in which it was higher than this average, as in the first part of January and February, while in the last of January it was quite low. The uric acid averages 0.28. The daily variation at times is somewhat large in both urea and uric acid. The average ratio of uric acid to urea is 1:56. The proteids were very con-

stant, varying little from the average: 50. This amount is a low diet for even an individual of 90 pounds, making only 1.1 gram of proteid per kilogram of body weight. It is interesting to note that Parkes²⁴ gives exactly this figure for a subsistence diet at rest. The average percentage of urea to proteid is 31 per cent.

What is entirely different in this case from the others in which we have had diet records to make such a study, is that the solids, urea and uric acid are not diminished relatively. This is further evident, since she lived on a subsistence diet and did not lose weight. The low ratio of uric acid to urea falls outside of what has been observed in most of our cases, yet no significance is to be attached to it, as such exceptions occur in health, a low ratio being a peculiarity of certain individuals.

Case V. A. M. B. Female, aged 63. Admitted January 31, 1893. When 39 she was melancholy for a month after the drowning of her son. She had influenza a year ago last fall, and the second time three months ago. After the last illness she began to be depressed, seclusive; had delusions of persecutions; agitated till two weeks before admission; during this last fortnight was in a state of stupor. Attempted suicide. In February had to be fed. During the next five months, from March to last of July, she ate little, only enough to hold her strength. Her mental condition: depressed and deluded; would stand around in the halls; talked very little. The observations were made during this period. However, in July she gradually grew worse, and by the end of July it was impossible to obtain the 24 hours amount of urine. Her weight rose from 92½ pounds June 1, to 95½ July 1, and fell in July to 83 pounds.

Discussion.—The amount of urine is remarkably low, averaging only 450 cc., varying between 250 and 900; however, these are exceptionally low and high, for the variation is very little throughout the course of observation. The solids are diminished, averaging only 23.80. The urea vibrates between 4 and 20, being on an average 10.48. The average for June is 10.4, for July 9.49. This is interesting, as in July the patient grew worse, and more so as the uric acid remains about the same, being 0.318 and 0.31, thus making the ratio for June 1:33 and July 1:30. This increase of the ratio along with the diminution of the total nitrogen seems to be a normal tendency (V. Noorden).²⁵ The uric acid varies between 0.15 and 0.55, averaging 0.31. The average ratio between uric acid and urea is 1:32.

²⁴ Parkes' Practical Hygiene, vol. 2, American ed., 1884, p. 211.

²⁵ Op. cit. p. 54.

Case VI. E. G. F. Female, aged 74. Admitted September 13, 1891. She has had three attacks of melancholia, eight, four and two years ago. She recovered from each, but the duration of the attack was longer each time. She is depressed, easily disturbed, has some delusions of persecution, sleeps poorly. From July to December, 1892, there was little change in patient's condition, she being depressed, complaining of many pains; slight noises disturb her, she is fearful of impending dangers of various kinds. During this time her weight varied between 140 and 143 pounds.

Discussion.—These notes refer to the results of ten-day averages. The amount of urine varies little from the average, 629 cc. The average specific gravity is 1019. The solids average 28, tending to a higher level in the last half of the observations. The urea rises slightly from the beginning, the average being 12.99. The uric acid averages 0.27. The ratio of uric acid to urea varies little from 1:48. In other words, the quantity of urine, solids, urea and uric acid are all markedly diminished, with a low ratio of uric acid to urea, as in Case IV.

Case VII. R. E. S. Male, aged 59. Admitted July 21, 1893. No heredity. At 22 he had "nervous prostration," and made a slow recovery. He has had like trouble since from time to time. He has been applying himself too closely to business for some while. Six months ago he began to worry concerning financial affairs. This anxiety grew more marked, so that six weeks ago he became depressed, apprehensive of impending trouble, fearing poverty, and was somewhat suicidal. No hallucinations. Insomnia. Failing appetite. During the period of the observations his condition was briefly as follows: Up to August 10 there was slight change; he was usually depressed, and only at times a little more cheerful. From then on he grew better, eating and sleeping well. Discharged December 8, recovered.

Discussion.—The amount of urine is diminished, yet it showed a constant tendency to rise from August 16—i. e., from the time he began to improve—and on September 2 reached practically normal. The solids varied between 22 and 30. The urea is very low throughout. The uric acid is also low. In the daily changes the ratio of uric acid to urea vibrated between 1:20 and 1:60, and the average is 1:34. The proteids were estimated during the first two weeks and the last four days. It was found that they fell in the three first days from 80 to 32—the urea and uric acid following. From that time the proteids rose to 140, August 13, while urea and uric acid fell. He lost weight from

July 21 to August 1, two pounds, and in August gained nine pounds.

Case VIII. W. M. Male, aged 29. Admitted April 23, 1894. No illness except rheumatism twelve years ago. For the past three months he has been morose, crying, worrying over his work and finances. The last of March he said that his "mind was not right and not clear." Three weeks before admission he wandered out in the street in his night-clothes. He has insomnia; is not suicidal. Weight 115. During May he improved until the 28th, when he was much depressed, even suicidal in talk. From this time he improved, at first gradually, until September 22, when he suddenly cleared up mentally, and was cheerful to the time of his leaving the hospital, November 7, "recovered." While under observation he lost four pounds.

Discussion.—The amount of urine varies between 400 and 1660 cc., averaging 788 cc., the average for May being 863, while for June 736. The solids varied considerably, the average being 37.37. The urea varied within somewhat wide limits, the average for May being 17.70, for June 18.20, and for the whole period 17.95. The uric acid for the same time was 0.49, 0.57 and 0.54, respectively. The ratio, however, changes comparatively little from the average, 1:33; it being in May 1:34, and in June 1:37—that is, it has a falling tendency. To sum up, the urine, solids, urea and uric acid are all diminished, the ratio of uric acid to urea being normal.

Case IX. J. J. B. Male, aged 60. Admitted July 5, 1892. A man of nervous disposition; was a patient in the hospital for six months in 1885 with an attack of melancholia. In good health until last January, when he had influenza. Two weeks before admission, family trouble brought on another mild attack; he was extremely anxious, nervous, and worrying about himself and family. During the first few days he was less anxious than from July 9 to the end of the observation.

Discussion.—The amount of urine averages 1445 cc. During the first four days it was higher, about 1899 cc., than in the following days. It is during this time that he was less disturbed than afterwards. The specific gravity, 1016; the solids, 55; and the urea, 31, are normal. The uric acid, 0.64, is not as high as is usual, yet, as was said in Case V, the ratio of 1:49 between uric acid and urea is not pathological. In this case of a slight attack of melancholia the amount of urine, solids, urea and uric acid, and the ratio between the latter two are all normal.

Case X. F. T. B. Male, aged 27. Admitted May 2, 1892. Naturally cheerful. Enjoyed good health to about February 1. The death of an intimate friend in the winter depressed him much, and in March he was in such a debilitated and discouraged condition that he had to stop work. This did not improve him, as he worried, became suspicious and depressed. Just before admission he was much excited, fearing he was to be lynched, and was suicidal. He had insomnia and a poor appetite. During May and June he ate little, having to be fed; slept poorly. Mentally he was much depressed, deluded as to his own wickedness, and occasionally in a stupid condition. While under observation he steadily improved, so that by the last of September he seemed perfectly well, and in November was discharged recovered.

Discussion.—The amount of urine during July is diminished (see table, p. 525). However, from the end of July, as he grew better, the quantity of urine increased, and by the middle of August it was normal. The solids show the same increase, but here it is more gradual. The urea and uric acid went hand in hand, increasing from a low level up to near the normal. The increase showed itself on the first of August. The ratio of uric acid to urea oscillated about 1:33. The patient unquestionably ate and drank less in July, when he was losing weight, and was still depressed. Such a state of affairs would easily account for the diminished nitrogenous excretion and the quantity of urine and the solids. Similarly an increase in the diet would produce a corresponding change in the urinary constituents. Below is a table which will show the monthly changes.

	Amt.	Sp. Gr.	Solids.	Urea.	Uric Acid.	$\frac{\text{U}}{\text{U}} : \frac{\text{U}}{\text{U}}$	Weight.*
July.....	601	1017.5	24.15	10.66	.3411	1 : 31	119
August...	1152	1012	46.29	15.70	.4352	1 : 36	123
Sept.....	1510	1015	52.27	19.29	.6405	1 : 30	141

* Weights are taken the first of the month.

Here the amounts of urine, solids, urea and uric acid are decidedly diminished in July, when he was at the acme of his melancholia, and increased *pari passu* with his improvement. It is particularly interesting to note how little the ratio of uric acid to urea varies in the very different conditions, as in July when he was quite ill, and in September when he had recovered.

CASE I.

	Date.	No. of observ.	Amt. of Urine.	Sp Gr.	Solids.	Urea.	Uric Acid.	Ratio, U : U.	Body Weight.	Amt. of Proteids.	Perc. Urea in Proteids.
1892.	March....	14	940	1023	48.18	14.83	0.65	1 : 33	106*		
	April.....	11	1063	1021	51.87	16.00	0.62	1 : 36	110½		
	May.....	24	1063	1020	49.40	18.55	0.56	1 : 33	111½		
	Averages..	49	1033	1021	49.34	16.45	0.61	1 : 27	111†		
1893.	July.....	15	894	1018	37.54	14.00	0.53	1 : 37	110½	60	23
	August....	31	1062	1016	41.20	16.71	0.51	1 : 33	109½	92	18
	September	25	1037	1016	37.98	16.84	0.45	1 : 37	108½	97	17
	October...	25	966	1017	38.25	18.40	0.49	1 : 38	113	119	16
	November.	28	1178	1018	49.47	24.07	0.54	1 : 44	112½	109	22
	December.	27	1001	1019	44.27	21.22	0.47	1 : 45	109	101	21
1894.	January...	24	1046	1022	54.87	17.50	0.48	1 : 36	106½	91	19
	February..	24	720	1022	36.91	13.60	0.44	1 : 31	109½		
	March....	25	847	1017	33.57	13.72	0.46	1 : 30	106		
	April.....	28	902	1019	37.35	16.10	0.47	1 : 34	106		
	May.....	28	988	1017	37.11	15.14	0.45	1 : 35	109		
	June.....	30	883	1017	34.97	14.33	0.45	1 : 32	107		
	July.....	25	904	1015	31.26	15.08	0.52	1 : 29	..		
	August....	28	1073	1016	39.89	15.04	0.53	1 : 28	107		
	September	27	1018	1015	35.55	13.77	0.52	1 : 26	113		
	October...	25	897	1019	39.82	13.68	0.54	1 : 25	112		
	November.	23	831	1020	38.72	14.30	0.58	1 : 25	114		
	December.	16	912	1021	44.62	16.06	0.60	1 : 27	113		
Averages.....		..	952	1018	39.93	16.05	0.50	1 : 32		94	19
Total averages..		502	960	1019	41.10	16.13	0.54	1 : 30			

* Weights are taken the first of the month.

† Weight of June.

CASE II.

Date.	Amt. of urine.	Sp. Gr.	Solids.	Urea.	Uric acid.	Ratio. — + U : U.	Amt. of proteids.	% of urea to protoids.
Oct. 24 to Nov. 2.	840	1021	39.70	18.14	0.52	1 : 36	86	21
Nov. 3 to Nov. 12.	950	1014	31.55	16.00	0.34	1 : 46	94	17
Nov. 13 to Nov. 22.	1070	1014	35.84	18.12	0.39	1 : 45	91	20
Nov. 23 to Dec. 2.	1130	1016	43.50	17.40	0.64	1 : 27	91	19
Dec. 3 to Dec. 9..	975	1017	46.37	19.75	0.46	1 : 49	85	26
Average.....	993	1016	39.38	17.88	0.47	1 : 39	89	19

CASE III.

August.....	1507	1012	41.75	23.56	0.73	1 : 32	100	24
September.....	1401	1012	40.97	18.09	0.54	1 : 33	97	19
October.....	1884	1015	46.52	24.14	0.62	1 : 39	89	27
November.....	1112	1017	43.89	21.57	0.49	1 : 43	91	24
December.....	1140	1018	43.70	20.37	0.50	1 : 40	91	22
Average.....	1305	1014	43.26	21.54	0.58	1 : 37	93	22

CASE IV.

1892 and 1893.	Amt. of Urine.	Sp. Gr.	Solids.	Urea.	Uric Acid.	Ratio. — + U : U.	Amt. of Proteids.	% of urea to Proteids.
Dec. 21 to Jan. 3...	659	1021	32.23	14.09	0.21	1 : 67	55	26
Jan. 4 to Jan. 13...	809	1018	35.48	17.61	0.28	1 : 62	50	35
Jan. 14 to Jan. 23..	649	1021	31.03	14.73	0.30	1 : 48	49	30
Jan. 24 to Feb. 7...	700	1022	35.14	15.67	0.25	1 : 47	47	33
Feb. 8 to Feb. 19..	941	1020	46.29	20.30	0.31	1 : 63	50	40
Feb. 20 to Mar. 1..	710	1022	36.77	15.31	0.27	1 : 46	51	30
Mar. 2 to Mar. 12..	681	1023	39.22	14.78	0.30	1 : 49	48	30
Mar. 13 to Mar. 23..	803	1020	37.29	16.69	0.30	1 : 56	51	33
Mar. 24 to April 5..	630	1023	33.41	14.43	0.25	1 : 53	48	30
April 6 to May 5...	610	1025	37.00	15.66	0.29	1 : 50	50	33
Average.....	714	1022	36.38	15.38	0.28	1 : 56	50.4	31

CASE V.

1898.	Amt. of Urine.	Sp. Gr.	Solids.	Urea.	Uric Acid.	Ratio. — + U : U.	Amt. of Pro- teids.	% of urea to Pro- teids.
May 27 to June 7..	529	1024	27.95	12.65	0.86	1 : 35		
June 8 to June 19..	434	1025	24.15	11.28	0.81	1 : 27		
June 21 to June 30.	423	1023	20.64	9.50	0.28	1 : 34		
July 1 to July 13..	506	1026	28.60	11.05	0.84	1 : 35		
July 14 to July 20..	360	1023	17.70	7.94	0.29	1 : 27		
Average.....	450	1024	23.80	10.48	0.81	1 : 32		

CASE VI.

DATE.		Amt. of Urine.	Sp. Gr.	Solids.	Urea.	Uric Acid.	Ratio. — + U : U.
From.	To.						
July 8....	July 22....	583	1017	25.09	11.3	0.25	1 : 45
Sept. 2....	Sept. 11....	627	1017	24.79	10.7	0.27	1 : 39
Sept. 12....	Sept. 24....	669	1015	23.38	11.0	0.26	1 : 44
Sept. 25....	Oct. 5.....	650	1017	25.74	13.0	0.28	1 : 46
Oct. 6.....	Oct. 21....	661	1018	27.73	14.9	0.26	1 : 57
Oct. 22....	Nov. 8.....	561	1020	26.13	12.6	0.26	1 : 55
Nov. 10....	Nov. 24....	685	1021	33.52	15.3	0.32	1 : 46
Nov. 25....	Dec. 8.....	633	1021	30.95	14.3	0.25	1 : 56
Dec. 10....	Dec. 24....	676	1021	33.06	14.3	0.27	1 : 53
Dec. 26....	Jan. 3.....	565	1022	28.97	12.5	0.28	1 : 44
Averages.....		629	1019	28.00	12.99	0.27	1 : 48

CASE VII.

DATE.		Amt. of Urine.	Sp. Gr.	Solids.	Urea.	Uric Acid.	Ratio. — + U : U.	Amt. of Proteids.	% of Urea to Pro- teids.
From.	To.								
July 31..	Aug. 10.	473	1026	30.20	14.40	0.45	1 : 32	82	18
Aug. 11.	Aug. 20.	522	1020	22.15	10.35	0.32	1 : 33	..	..
Aug. 21.	Aug. 30.	564	1023	26.70	12.90	0.44	1 : 29	..	..
Aug. 31.	Sept. 3..	920	1014	28.87	12.31	0.28	1 : 44	120	10
Average.....		620	1021	26.98	12.49	0.37	1 : 34	101	12.6

CASE VIII.

DATE.		Amt. of Urine.	Sp. Gr.	Solids.	Urea.	Uric Acid.	Ratio. — + U : U.	Amt. of Protoids.	% of Urea to Pro- toids.
From.	To.								
May 9...	May 18..	955	1020	41.90	19.30	0.56	1 : 35		
May 19..	June 1..	796	1020	34.30	16.10	0.43	1 : 37		
June 2..	June 20..	765	1025	41.60	20.30	0.69	1 : 29		
June 21..	June 29..	688	1023	31.69	16.11	0.46	1 : 35		
Average.....		788	1022	37.37	17.95	0.54	1 : 33		

CASE IX.

July 7..	July 13..	1560	1016	53.43	31.41	0.59	1 : 53		
July 14..	July 19..	1830	1016	57.33	31.33	0.68	1 : 46		
Average.....		1445	1016	55.38	31.37	0.64	1 : 49		

CASE X.

DATE.		Amt. of Urine.	Sp. Gr.	Solids.	Urea.	Uric Acid.	Ratio. — + U : U.
From.	To.						
July 1.....	July 11.....	752	1017	27.70	11.76	0.40	1 : 27
July 13.....	July 25.....	547	1015	19.78	9.80	0.27	1 : 36
July 26.....	Aug. 4.....	745	1017	24.30	10.37	0.30	1 : 34
Aug. 6.....	Aug. 16.....	1182	1013	36.15	15.24	0.36	1 : 42
Aug. 17.....	Aug. 26.....	1443	1011	38.10	18.09	0.54	1 : 33
Aug. 28.....	Sept. 7.....	1465	1014	45.08	16.97	0.47	1 : 40
Sept. 8.....	Sept. 21.....	1495	1015	51.05	19.58	0.63	1 : 31
Sept. 22.....	Sept. 25.....	1685	1015	58.08	18.12	0.69	1 : 26
Averages.....		1163	1014	37.53	14.83	0.45	1 : 33

GENERAL SUMMARY.

The amount of urine.—In these cases in which the observation extends over some period of time the urine is usually diminished, at times remarkably so, increasing in amount with the patient's improvement. However, there are two cases (III and IX) where the amount is not abnormal, both of these being mildly sick. In the cases I and II the amount is only slightly diminished. The explanation of this lessened amount of urine is, very probably, due to the little fluid taken in by these patients, hence the excretion is small.

The specific gravity.—This is within normal limits in all cases, contrary to the high specific gravity observed by Stefani.

The solids.—They are diminished among these patients with one exception (IX), who was only mildly depressed.

Urea.—This is almost always diminished, in some cases very low, as in V, (8 grams). In one instance (IX), a case of mild melancholia, it is normal. In case X, where there is a marked improvement during observation, the urea rises from 9.8 to 19; and in case I, during a period of temporary improvement, there is a slight increase in the amount of urea; yet in four other patients, where there is a slight and gradual improvement, no corresponding rise is noticed in the amount of urea.

Uric Acid.—Uric acid is, as a rule, diminished. It is, however, not the absolute amount of uric acid, but its ratio to urea, that indicates whether there is any relation between it and the patient's condition. As stated above, the ratio differs considerably in normal individuals. Let us see whether in these cases there are either very low or very high ratios, and whether the ratio curve bears any relation to the improvement.

Case I. For the first attack a fall from 1:23 to 1:33 occurs; this goes parallel with a marked improvement. When in the first part of the second attack the patient is becoming worse there is a fall in the ratio (1:27-1:37), which fall continues during three months of improvement (1:37-1:45). The ratio rises from January to March (1:36-1:30), while the patient is worse, from then on the condition of the patient is stationary, and the ratio, while varying between 1:35 and 1:26, shows no rising or falling tendency.

Case II. Shows variations between 1:27 and 1:49, which is

within normal limits. There is no tendency to rise or fall with the improvement in the patient's condition.

Case III. Ratio normal (1:32-1:43), and there is a steady fall as the patient improves.

Case IV. Ratio is low (1:46-1:67), with a tendency to rise in the second half of the observations, there being no change in the patient.

Case V. Ratio normal (1:27-1:35), varying little, showing no tendency in one way or the other, the patient's condition is stationary.

Case VI. Ratio rather low (1:56-1:39). No tendency to fall or rise. Condition stationary.

Case VII. Ratio normal (1:29-1:44), the latter figure representing observations made when he was slightly better.

Case VIII. Ratio normal (1:29-1:37). No tendency to rise or fall with patient's improvement.

Case IX. Ratio rather low (1:46-1:53). Condition stationary.

Case X. Ratio varies within normal limits (1:27-1:42). This patient was at first very ill, but improved rapidly and during last observations was practically well. The ratio shows no relation to this change.

In conclusion, a very high ratio is seen only in the first attack of Case I; this returns to normal as the patient improves. In the second attack, however, the relation which seems to be present in the first attack is not seen. Low ratios are found in IV, VI and IX. The condition of these patients is stationary. The other cases (II, III, V, VIII, X), show ratios within normal limits. All of these but V improved during observation, X so much so that he became practically well. In none was this improvement expressed in the ratio curve. Case III, however, shows a steady fall in the ratio curve which runs parallel with the improvement in her condition. Hence in these cases there is no constant relation between the mental condition and the ratio of uric acid to urea.

While the results are negative as regards the ratio of uric acid to urea, they are positive and uniform as regards the diminished amount of urea and uric acid. The most natural cause of this diminution, noted by other observers, is that these patients eat

less than do normal individuals. The proteids were calculated in five cases, as described above (see case I), in order to decide this point. If it is supposed that the estimate of the proteids is accurate, then it is seen in four of the five cases that the percentage of the relation of the urea to the proteids is low. In other words, the nitrogenous excretion in the urine is not only absolutely, but relatively, diminished in comparison with the amount of proteid taken in. A storing up of body albumin, as shown by an increase in weight, would explain such a condition. However, as only one of these patients gains weight while the percentage of urea to proteids is low, this supposition, as expected, is inadequate to explain these facts.

Another possible, and perhaps in some cases a true explanation, is that there is a diminished absorption of the food ingested. Such a conclusion cannot be drawn from these cases, as the method of estimating the proteid is too crude. Later careful experiments showed that the method used on these cases made the proteid usually too high, and only occasionally too low. This, also, speaks against the theory of diminished nitrogenous absorption in these patients. Yet, in some subsequent observations made in a case of melancholia where the weight did not change, the percentage of the urea to proteid is diminished as in our four cases. This would seem to give credence to the theory of diminished absorption of proteid in some cases of melancholia. The last series of observations made in the McLean Hospital Laboratory were kindly given to the writer by Dr. A. Hoch, whom I wish here to thank for his great assistance in revising this article. In this case the food was accurately weighed and the proteid calculated, the total nitrogen in the urine was estimated by Kjeldahl's method and converted into terms of urea (see table).

Date.	Proteids.	Urea.	% of Urea to Proteids.
April 13 (1895) ..	63.38	10.05	16
" 14	72.16	11.18	16
" 15	71.16	9.68	14
" 16	75.14	10.34	14
" 17	136.65	21.00	15
" 18	92.27	22.28	24
" 19	106.25	25.59	24
" 20	99.04	25.58	26
" 21	210.70	24.60	11
" 22	88.96	11.05	12
" 23	72.79	20.34	28
" 24	115.95	17.95	16
" 25	66.78	18.08	27

However, a careful examination of the faeces must be made along with the nitrogen in the urine, and accurate estimation of the proteid ingested, before the apparent result of these last observations can be considered conclusive. Not having such observations, it can only be said that the diminution of urea and uric acid is absolute, and due probably to a lessened ingestion of proteid.

CONCLUSIONS ON MELANCHOLIA.

- (1) The amounts of urine and solids are generally diminished, and they usually increase with the patient's improvement.
- (2) The specific gravity is normal.
- (3) The urea and uric acid are, as a rule, diminished.
- (4) The diminution in nitrogenous excretions is due, in most cases, to a diminished ingestion of proteids, but in some it may possibly result from a lessened absorption of food.
- (5) The ratio of uric acid to urea shows no constant relation to the mental condition.

A case is appended to this series which cannot be classified as a simple melancholia, but as there were distinct periods in which depression was marked, an investigation of the excretion is of value in comparison to the previous cases.

Case XI. B. H. Male, age 23. Admitted January 15, 1893. When a child four years of age he had severe diphtheria and scarlet fever. Following this he had a series of "cataleptic fits." He forgot everything he had previously learned. Recovered from his "cataleptic seizures" in about a year, but is said never to have been as bright mentally since.

Present illness began two years ago. He lost a good position. This discouraged him, and he became restless. Thought that people were persecuting him. About this time he began to indulge in sexual and alcoholic excesses. During past two years he had been growing steadily worse mentally. For past six weeks he has been at a sanitarium. His memory is poor, has no power of application, and is unable to take any responsibility. Is very suspicious of those about him; has been suicidal at times for the past year.

The clinical picture may be summed up as follows: At first he was suspicious; had some delusions of persecutions; soon he got into a state in which he remained during the greater part of his stay in hospital, often appearing stupid and confused, at times showing many confused delusions, usually of a depressive nature. In conversation he made senseless and irrelevant remarks and wrote meaningless and incoherent letters;

made persistent impulsive suicidal attempts, also would suddenly attack those about him. From this stupid and depressed condition he would frequently become clear.

Owing to the periodicity of these symptoms a record was kept, beginning with July 29, of the duration of such periods. On some occasions the time of the transition could be fixed to a certain part of the day. While at other times two or three days intervened before one could say whether he was mildly depressed and confused, or in his normal condition. These days of some uncertainty are not classified in either period. The time and duration of these periods can be seen in the table. The manifest periodicity stopped after December 18. His depressed periods varied from eight to ten days, and on an average were 7.8 days long. His normal period varied from two to ten days, and was on an average 7.4 days long. While the duration of the cycle varied from 13 to 22, and on an average lasted 18 days.

TABLE SHOWING THE DURATION OF THE DIFFERENT PERIODS IN CASE XI (B. H.)

Dates.		No. of Days in:		
Beginning.	Ending.	Confused.	Normal.	Entire Cycle.
July 29.	August 7.		10	
August 8.	August 14.	7		21
August 19.	August 20.		2	
August 22.	August 31.	10		18
September 2.	September 9.		8	
September 11.	September 17.	7		18
September 20.	September 24.		5	
September 26.	October 5.	10		18
October 8.	October 15.		8	
October 17.	October 23.	7		18
October 26.	November 2.		8	
November 5.	November 13.	9		22
November 15.	November 22.		8	
November 24.	December 1.	8		18
December 3.	December 12.		10	
December 14.	December 18.	5		16
Average.....		7.8	7.4	18

From December 19 to the time of his leaving the hospital he gradually improved, being cheerful and bright most of the time. However, it must be remarked that the improvement was not without some interruption. His weight rose gradually from 138, after falling in March to 133, to 159 in February, the last two months it was 154 pounds. He was discharged in July "recovered." It has been learned later that, although able to do some work, his capacity is below the average. This case must be regarded as one of the so-called "Verblödungsprocesse" in the sense of Kraepelin, and is one which formerly was considered as a peculiar case of melancholia, owing to his evident depression.

CASE XI.—B. H. AVERAGES OF RESULTS OF URINARY OBSERVATIONS DURING CONFUSED AND WELL PERIODS.

DATER.		Sleep.		Am. in oc.		Sp. Gr.		Solids.		Urea.		Uric Acid.		Ratio $\frac{U}{S} + \frac{U}{T}$		$\frac{U}{S} + \frac{U}{T}$ to solids.		Proteids.		$\frac{U}{S} + \frac{U}{T}$ to Prot.		$\frac{U}{S} + \frac{U}{T}$ to Prot.	
Beginning.	Ending.	Con.	Nor.	Con.	Nor.	Con.	Nor.	Con.	Nor.	Con.	Nor.	Con.	Nor.	Con.	Nor.	Con.	Nor.	Con.	Nor.	Con.	Nor.	Con.	Nor.
July 29/98	Aug. 7.	...	6.4	997	1018	41.94	22.48	...	60	1.375	...	57.1	...	68	...	20	...	110	...	20	...	...	...
Aug. 8.	" 14.	3.8	660	1024	86.90	17.07	12.72	...	49	1.361	...	47.6	...	68	...	25	...	114	...	25	...	...	...
" 19.	" 30.	5.5	1065	1012	28.14	...	...	...	48	1.266	...	40.8	...	67	...	11	...	22	...	...	...	...	...
" 22.	" 31.	4.2	792	1020	86.80	14.87	...	...	52	1.287	...	41.8	...	67	...	...	...	...	...	...	...	...	...
Sept. 2.	Sept. 9.	4.5	926	1010	21.58	9.48	...	...	52	1.295	...	46.4	...	...	...	...	...	...	...	...	...	...	...
" 11.	" 17.	4.4	588	1028	81.26	17.52	...	...	56	1.319	...	48.3	...	...	...	...	...	...	...	...	...	...	...
" 20.	" 24.	4.9	1060	1012	80.20	11.98	...	...	84	1.34	...	47.6	...	...	...	...	...	...	...	...	...	...	...
" 26.	Oct. 6.	4.0	584	1020	87.21	19.02	...	...	70	1.27	...	88.6	...	...	...	...	...	...	...	...	...	...	...
Oct. 8.	" 15.	5.5	1115	1017	44.17	16.98	...	...	47	1.86	...	57.9	...	...	...	...	...	...	...	...	...	...	...
" 17.	" 28.	4.6	760	1019	38.65	18.90	...	...	60	1.81	...	87.9	...	...	...	...	...	...	...	...	...	...	...
" 26.	Nov. 2.	4.2	718	1060	50.19	19.49	...	...	75	1.96	...	43.9	...	...	...	...	...	...	...	...	...	...	...
Nov. 5.	" 18.	3.0	1575	1016	58.72	20.16	...	...	75	1.39	...	89.5	...	...	...	...	...	...	...	...	...	...	...
" 15.	" 22.	6.4	1370	1014	39.72	26.09	...	...	50	1.40	...	88.5	...	...	...	...	...	...	...	...	...	...	...
" 24.	Dec. 1.	5.8	1900	1016	70.88	26.45	...	...	79	1.33	...	54.8	...	...	...	...	...	...	...	...	...	...	...
Dec. 3.	" 12.	5.4	1478	1014	48.11	18.06	...	...	62	1.40	...	45.3	...	...	...	...	...	...	...	...	...	...	...
" 14.	" 18.	7.0	1800	1021	41.54	42.40	...	...	575	1.328	...	53.8	...	...	...	...	...	...	...	...	...	...	...
Averages.		4.97	5.85	989	1014	48.46	20.88	...	60	1.35	...	44	...	...	...	...	...	...	...	...	...	...	...
Dec. 19.	Dec. 27.	...	1654	1013	48.46	20.88	...	...	69	1.86	...	88	...	...	...	...	...	...	...	...	...	...	...
" 28.	Jan. 5/94.	...	2188	1014	48.93	18.16	...	...	66	1.26	...	88	...	...	...	...	...	...	...	...	...	...	...
Jan. 6/94.	" 14.	...	1471	1015	52.19	16.51	...	...	66	1.24	...	88	...	...	...	...	...	...	...	...	...	...	...
" 15.	" 23.	...	1451	1016	55.45	20.07	...	...	68	1.27	...	81	...	...	...	...	...	...	...	...	...	...	...
" 24.	Feb. 1.	...	1454	1017	67.10	20.97	...	...	77	1.27	...	84	...	...	...	...	...	...	...	...	...	...	...
Feb. 2.	" 10.	...	1624	1018	67.10	22.30	...	...	80	1.27	...	83	...	...	...	...	...	...	...	...	...	...	...
" 11.	" 19.	...	1735	1017	74.56	24.14	...	...	96	1.25	...	83	...	...	...	...	...	...	...	...	...	...	...
" 20.	" 28.	...	1608	1020	74.56	23.71	...	...	79	1.32	...	41	...	...	...	...	...	...	...	...	...	...	...
March 1.	March 9.	...	1981	1016	60.88	28.00	...	...	68	1.41	...	48	...	...	...	...	...	...	...	...	...	...	...
" 10.	" 30.	...	1865	1016	67.04	31.49	...	...	1.12	1.38	...	49	...	...	...	...	...	...	...	...	...	...	...
" 31.	" 30.	...	1848	1016	66.40	28.07	...	...	89	1.81	...	44	...	...	...	...	...	...	...	...	...	...	...
April 8.	" 16.	...	1581	1019	69.90	30.46	...	...	96	1.33	...	51	...	...	...	...	...	...	...	...	...	...	...
April 9.	" 16.	...	1586	1020	62.91	25.69	...	...	88	1.40	...	51	...	...	...	...	...	...	...	...	...	...	...
" 19.	" 26.	...	1516	1018	62.91	25.69	...	...	88	1.40	...	51	...	...	...	...	...	...	...	...	...	...	...
" 27.	May 2.	...	1800	1022	62.91	25.69	...	...	88	1.40	...	51	...	...	...	...	...	...	...	...	...	...	...
Averages		...	1687	1017	64.81	26.07	...	...	80	1.318	...	40	...	...	...	...	...	...	...	...	...	...	...

Discussion.—Amount of urine.—The variation in the quantity of urine during the different periods is very apparent from a glance at the table. It is constantly less in confused, and increases in the period of well-being, to finally oscillate around the normal. The average of the confused periods is 849 cc.; of the well periods, 1300 cc., and of convalescence, 1637.

Specific gravity.—Hand in hand with the above condition there was an inverse variation in the specific gravity up to November 15—i. e., higher in confused, lower in the normal state. In the last two cycles the specific gravity was about the same in depression (1014) as in the well period (1016). The average of the first six cycles is 1023 for the bad and 1014 for the good periods. During convalescence the specific gravity varies between 1013 and 1022, being higher towards the end.

Solids.—Five times out of eight the solids, as calculated by Häser's method, were higher during the well than during the confused periods. Three times the opposite was the case. The average of the periods, however, does not show a great difference. It is striking how, in the well periods, from the third cycle through the eighth, the solids rose gradually from 21.58 to 70.83. During convalescence the solids increase, oscillating about 65.

Proteids.—It was found that the patient ingested considerably less proteid, as calculated by the method described (see case I), during the five confused than during the well periods, as was to be expected; on an average, about half as much—53 grms. and 101 grms. respectively. The amount of proteid ingested during the well periods was practically the same as the average of the last two months that he was in the hospital—104 grams. A study of the results of the proteids in this case seems to be allowable, as the same method was used throughout, and the same errors would exist in the confused or in the well as in the convalescing periods.

Urea.—It is seen in tables that from August 19 to October 17 there is a constant rise in the average urea during confusion; before this there is a period in which the urea excretion during confusion is less than in the well period just before, and greater than that of the well period which followed. In the last three cycles the reverse is the case; namely, the urea of the well period is greater than that of the confused period, but the variation is less

marked, so that the average of the urea in all the confused and well periods shows a larger excretion of urea in depression (19.06 and 17.78 grams). In other words, not considering the amount of proteid ingested, it may be said that the patient excreted, for half the time, less; and half the time only a little more urea in his well than in his depressed periods.

During the last two months of his stay at the hospital, when he was practically well, the comparison of the urea excreted with the proteid ingested gives results (31.27 and 32 per cent.) which can be considered as normal in this case, the more so as in health 100 grams of dry proteid yield 31 grams of urea.* In general it is seen that, although the proteid ingested during his well periods corresponds to that ingested during the time he was perfectly normal, the urea did not, it being lower every time. Since the proteid ingestion is known, a table is made of the percentage that the urea excreted is of the proteid ingested (see next to the last column of tables), and this shows that invariably the percentage is greater during the confused than in the well periods before and after. Comparing, in general, this percentage (18) during the well periods with that (30) of the last two months, it is found that, in spite of the fact that the proteid ingested was the same, the percentage of urea is decidedly less, not even two-thirds of that of the latter part of his convalescence. In his confused periods, on the other hand, we find the percentage is not only greater each time than in the well period immediately preceding it, but in three cases it is greater than the average in convalescence. This coincides with the fact that usually the percentage of urea and uric acid in relation to the amount of solids is greater during the confused periods than during the well periods (52 and 45).

Uric Acid.—No constant variation in uric acid can be made out in reference to states of confusion and well-being. During the first half of his cycles the uric acid was lower in his normal periods; but from October 17 to the end of them the reverse was the case. An inspection of table I will show this, and also the remarkable similarity in the average amount of uric acid in all the confused and in all the normal periods—0.592 and 0.575.

* A. D. Waller, *An Introduction to Human Physiology*, 1891, p. 252.

From December 19 on there is a gradual and decided rise in the amount to the end of the observations, the average during convalescence being 0.80. This rise can be attributed most probably to the increase of the proteid ingested. This assumption is borne out by the fact that from December 28 to the end of the observations the uric acid increased *pari passu* with the proteid, the uric acid never varying more than 0.4 per cent. for each 1 per cent. of the proteid taken in.

If we calculate what percentage the urea and uric acid are of the total solid, it is found that during confusion it is nearer normal than in the well periods, 52.2 and 45.2, the normal in health being about 50. The average in convalescence is 40, while the average from March 21 to May is normal. The significance of these results seems to be that there is a probable increase in the chlorides, phosphates, and sulphates (the most important of the solids, excepting urea, in the urine) during the well periods of the cycles as compared to urea.

What inference can be drawn concerning uric acid, for which this study of the case was begun? The most important is that uric acid follows here the same laws as urea; this is shown by the fact that the ratio remains about the same, and that a curve representing the percentage of uric acid in relation to the proteid ingested shows the same character as a similar curve showing the percentage of urea.

On summing up we find that during the whole course of the disease the patient's metabolism shows a decided difference from that in the time of his recovery, inasmuch as the excretion of urea in relation to the proteid taken in during the well parts of his cycle was constantly below normal, being on an average 18 per cent.; during the confused periods being always above that of the preceding and succeeding well periods, and three times even above normal. That the former was the case in spite of the fact that the same amount of proteid was consumed as at the end of convalescence, and that the latter was the case notwithstanding the proteid taken in was less, points to the following probable explanation. It is well known that when the proteid is diminished below that required by the organism, some of the body albumin is utilized, so that the relative amount of urea excreted to the proteid ingested is more than in normal

nitrogenous equilibrium. And on the other hand, that, after a period when insufficient food has been taken in, a normal amount is again ingested, a storing up of body albumin occurs to replace the former loss in the organism," so that the relative amount of urea excreted to the proteid ingested is less than normal. This result, the increase of 20 per cent. (i. e. from 30 to 36) of the relative amount of urea to proteid taken in above normal, in the confused periods, explains, in part possibly, the rapid loss of body weight in such conditions.

Merson²² suggested this as the explanation of the loss of body weight in some cases of general paralysis, as he found an increased excretion of urea, not due to an increased proteid ingestion, but most likely to the using up of the body albumin. Now this seems to be just what happened in this case. The patient took insufficient food in his confused periods, and hence used up his body albumin; and in his well periods, when eating sufficiently, some of the proteid was used to restore the body albumin that was used up in his confused periods.

The convalescence was divided from December 19 into periods of nine days each, half of the duration of the whole cycle, in order to see if there was any tendency to fall and rise in the various elements as during his illness. On examining the table it is seen that the proteid falls in the three succeeding periods, which correspond to the depression; and the percentage of urea and uric acid to the proteid during the first period shows also the same tendency as before. There is no such tendency observed in the other curves. This would seem to indicate that his periods did not stop suddenly after the marked mental changes ceased, but gradually.

CONCLUSIONS ON CASE XI.

(1) The amount of urine is less in the confused periods than in the well periods, and in both parts of the cycle is less than during convalescence.

(2) The specific gravity is higher during the state of confusion

²² See Van Noorden, *Lehrbuch der Pathologie des Stoffwechsels*, p. 125.

²³ "The Urinology of General Paralysis," *West Riding Lunatic Asylum Medical Reports*, vol. IV, 1874, p. 89.

than during convalescence, and in the latter is higher than in the well periods.

(3) The solids excreted in the confused periods, in comparison with food taken in, are about twice the amount of the well periods, and in both parts of the cycles they are two-thirds of that of convalescence.

(4) The urea and uric acid are slightly more in his bad than in his well periods, but less than in health.

(5) The nitrogenous excretion seems to be slightly greater in the time of confusion than the intake; while in the well periods it is the reverse.

(6) On the whole, uric acid goes hand in hand with urea.

(7) The variation in the nitrogenous excretion can be explained by changes in the metabolism due to the variations in the amount of proteids ingested; yet it must be considered possible that it may be due to some change in the metabolism caused by the disease.

Before closing, I wish to express my thanks for the favors and assistance rendered me by the staff of the Hospital, and especially by the superintendent, Dr. Edward Cowles.

AN IMPROVED CLASSIFICATION AND TABULATION OF CASES OF INSANITY.

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This paper is an attempt to briefly set forth the advantages of a new method of classifying and tabulating cases of insanity, as exhibited in the appended table, which table applies the method upon the actual cases of the official year of 1894-1895 of the hospital with which I am connected.

The objections to the common tables used are for the most part well known. They are too diffuse and scattered. The facts intended to be conveyed can only be obtained by studying and figuring, and this is rarely attempted. There are too many figures and too few clinical facts. Even the clinical relations attempted are very vaguely shown. There is an abundance of general averages, with too little of figures applying to especial clinical groups. For example, if we take the "duration of insanity before admission" of the epileptics admitted, which might be, say fifteen years, and of the acute cases admitted, which might be possibly three months, and exhibit the general average of about seven years, we give a result which if stated by itself is almost devoid of clinical meaning, and in some cases actually misleading. Given alone in this case it changes the two significant relations into one of little value, yet this is what the present tables do throughout, and what we seek to avoid.

Again, most of the tables now in use, at the end of each year mix the year's fresh cases with the mass of chronics of all preceding years, and the actual outcome of any certain number of cases is thereby so fogged as to be never really known. We never hear of that year's cases by itself again. For example, suppose in a hospital 200 admissions in a year and 50 recoveries are reported, but these fifty recoveries are not from any specified

admissions, but from the whole mass, some of whom may have been there forty years. So are the deaths given, so are the number sent out improved, so too are the ages and various other data. Ordinarily only the diagnoses and the duration before admission are given for that especial year, while as regards following out any special class, like the senile cases, or the epileptic, or the acute cases, and finding out how long they live, what proportion of recoveries each may have, what proportion of deaths, what proportion of hereditary cases, what proportion of chronic, and so on, there is no possible means of disentangling these facts.

Such being the objections we seek to avoid, we turn to our attempt at remedying them. First, we will present the classifications. In this classification there is expressed an earnest attempt to collect the cases into clinical groups, bounding them as far as we can by lines which represent fundamental distinctions, and disregarding largely any temporary and trifling changes. The exaltation or depression which the case exhibits has long been regarded as one of the main distinguishing differences between the cases, but although it tends to be permanent, yet the two elements so frequently mix, mingle and change, and so rapidly fade into dementias in chronic cases, that, as they seem to lack much fundamental significance, we have been led to disregard them almost wholly in favor of more fundamental underlying conditions.

This classification presents four chief classes. For convenience sake, however, we would separate the first class (Class A), "Cases showing Retrograde Progression," into its two component parts and state all cases to be divided into five different classes, as follows: First, "Senile cases," either in simple decline or with gross organic changes, subdivided still farther according to ages. Second, those of "Specific causation," including alcoholic or drug cases, syphilitic cases, and general paresis. Third, "Cases showing initial or early defect," subdivided into imbeciles of three grades (arbitrarily adjudged adolescents), or developmental cases, epileptics (not including those senile), and paranoiacs (not including senile paranoiacs). Fourth, "Cases chronic before admission," excluding of course such chronic cases as belong to the above classes of paranoia, imbecility, etc. These are mostly terminal cases, but include also a few chronic

cases in which the mode of beginning is not known. Fifth, "Acute and curable cases," subdivided into ordinary manias and melancholias, and including mania-a-potu.

Of the "seniles" it is to be said that the class includes all those cases in which senility is the cause or helping condition. By senility we usually refer to circulatory and atrophic changes. In this table we do not note whether the case be senile paranoia, senile melancholia, or senile dementia, counting these of rather less actual value than the subdivision according to ages. This subdivision could, however, be inserted also if desired. Of course age alone is not the deciding point as regards senility. One case over sixty years of age has been put down as acute mania because of the absence of senile causative elements, the acute attack and the lack of dementia both before the attack and after recovery. The diagnostic signs are found in the circulatory changes of the heart and arteries and perhaps secondarily in the kidneys, fatty changes, senile appearance of the body, arcus senilis, a slow invasion, and a dementia at the bottom of whatever form of melancholia or other emotional state is found.

At the beginning of life and, figuratively, at the other end of this line, we find an even larger number of cases. Of actual imbeciles (those in which we can get a statement of some kind concerning defectiveness in childhood by the relatives) we get a few cases. Of a somewhat higher grade in imbecility, including those whose defectiveness extends back to childhood, but who have had somewhat of ability to learn and to do, we receive a somewhat larger number. These have been known as "queer," or "odd," or "not bright." Some have been to the reform school, or are of the behavior which frequently leads there.

Of a class one step higher than this, including young people becoming definitely known as insane at about the ages fifteen to twenty-five, we have, however, a large number. We term these the "adolescent" or "developmental" cases. The diagnosis is based somewhat more on the age than is that of senility, but by no means wholly or entirely so. There is a tendency toward terminal dementia in this class of cases, and we are of the opinion that they also interlink very decidedly with imbecility in their characteristics. Most of them are dull and have been always in some way below grade. They are committed frequently because of an accumulation of the troubles which have been for a long

time peculiar to them. Some of them, instead of a general dullness, have brightness and activity, and their trouble is manifested, not so much by a symmetrical letting down of general ability as by special perversion or eccentricity, or perverse immorality. Recoveries in those who suffer from acute attacks leave a strong liability to other attacks. To bring out this idea in the thirty-one adolescents listed in the appended table, eighteen have a general mental dullness extending back indefinitely into their teens. Thirteen come here with a history of acute onset or attack; but of these thirteen, six cases had previous attacks, dating back to between sixteen and nineteen years of age; while of the remaining seven, three are now having their first attacks here at from sixteen to twenty years of age, and in the remaining four the acute attack is merely superimposed upon a previous mental dullness.

The remainder of the five classes, as they are based on commonly used distinctions, will perhaps need little if any comment. Some special explanatory notes are perhaps needed.

1. We have placed paranoia (under which name we only put cases quite typical in character) under the general heading of developmental cases. Among the senile cases there occur very perfect cases of paranoia due probably to slowly invading circulatory changes. These are classed as senile. While most of the paranoiacs are fairly developmental in that they reach back into the developmental period, and while in strict construction only such should be included, we have included an occasional case in which such history cannot be obtained, chiefly to avoid another class of paranoia, under the head of "Cases becoming chronic before admission."

2. Chronic manias, chronic melancholias and terminal dementias have very loosely dividing lines; for terminal dementia begins to creep in early even in the acute stages in insanity. Moreover, in some dull cases it is hard to say of a special case whether exaltation or depression predominates, and indeed, in our opinion, it makes very little difference. Chronicity and the characteristic of a permanent unchanging state of mind are the real prognostic elements.

3. In as far as knowledge can be had we would not change the diagnostic condition of the case because of the length of time which has elapsed. An imbecile or adolescent is called an imbe-

cile or adolescent even if not admitted till fifty years of age. The same is true of the other classes, with the exception (more apparent than real) of the class called "chronic before admission."

4. Cases in which there is an irregular or a quite perfectly cyclical periodicity are disposed of by placing first those which are adolescent in the class of adolescents. This will probably dispose of the majority of these cases. Those which are not adolescent, if the recovery is not complete, are placed among chronic cases. A case in which a complete recovery takes place, if the recovery maintains long enough, so that the patient leaves the hospital and keeps well through a period of three to six months thereafter, is discharged as recovered, and must necessarily come in the next time as an acute case, or, if adolescent, among the adolescents. If the recovery does not last long enough to secure discharge it is of course ignored. The bugbear of *recurrent attacks* and of cases having periodical tendencies does not appear very serious when placed in this light, for as far as vitiating the table goes, not the whole number of commitments is to be considered, but only those which had been discharged as recovered. Such patients in this hospital are very few. A complete study of commitments is, however, best made by putting them in a separate table and analyzing them exhaustively.

5. In forming these tables it is not practicable nor advisable to avoid changing very frequently the opinions expressed in the admission papers. These papers are often grossly wrong, at times even denying heredity when there is a relative in the same hospital. This table therefore cannot correspond with the admission papers. To be most conscientious and true, the latest information obtainable at the end of the year from letters and from conversation with relatives and friends must be incorporated. Inconsistency even with one's own previous records is of trifling consequence.

6. The word "curable" is used only in Class D. It will be readily seen, however, that there are occasional recoveries among the adolescent class and occasional ones among the senile cases.

7. It is to be emphatically noticed, however, that this table, in its original form, for office use, has each individual *listed by name*, the name placed in its special class, and the changes in each name of each group being noted at the end of the year for that

group. The table printed here is condensed into groups represented by figures because of the space taken, and for that reason only.

Of the tabulation it is to be said that it simply consists in placing as many of the items of clinical import as it is practicable to collect in one printed table, and as carrying the cases in this table through as many succeeding years as is desired, until at least they become wholly chronic cases. This table is kept separately for the cases of a particular year, the discharges and deaths for each year being added at the end thereof. Crowding so many elements into one tabulation is for the sake of the impression made by what may be called the graphic element, the ready sight of the relationships of which would be dissipated and lost if on separate pages.

We will only hint at the beginning of the studies which this table enables us to make. General paretics and seniles show graphically the greater number of the deaths in the early years. Adolescents and imbeciles show the lowest number. Acute and curable cases show the larger number of recoveries, adolescents few, seniles and others very few. Adolescents are seen to be almost always single, seniles and others almost always to have been married. The grouping of ages is seen quite graphically. Imbeciles are seen to be of rather advanced years, the younger and more gross cases of course going preferably to schools for imbeciles. The "duration before admission" can be studied with regard to each group separately. The relative location of the multiple attacks, and the location of the unimproved at the end of three or five years, is clear. In short, the relation which any one of these elements bears to any of the others is thus placed in graphic form.

Moreover, from the original form of this table, made out by individuals, additional studies or adjunct tabulation can easily be made out. For example, a study in the prognosis of each form will be most easily made.

With these explanatory comments we present a tabulation of one year's admissions to the Rochester State Hospital, carried through the two succeeding years. It is of course the aim and object of this attempt to be thoroughly practical, and to this end criticism is invited to bring out, if possible, any weak points therein.

CONDITION OF THOSE LEAVING.

CONDITION OF THOSE REMAINING

During year ending Aug. 1, 1896.					During year ending Aug. 1, 1897.					Remaining in Hospital, Aug. 1, 1897.			
Recovered.	Much Improved.	Improved.	Unimproved.	Died.	Recovered.	Much Improved.	Improved.	Unimproved.	Died.	Recovered.	Much Improved.	Improved.	Unimproved.
			1	1					1				3
			1	1					1				3
		2		1					1				3
				2									2
				2									1
				1									1
				2					1				
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		2				1							4
			1										
		1	1										6
1	1	1	1	1			1						16
		1	2										7
	1	3		1									5
1	1	3											7
		2		3			1	1	3				10
				1									9
	9	4		1		1							6
		1											
1													
4	1	3		3	1		1	1	1				11
							1						2
16	4	23	7	16	1	2	4	2	7				96

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THE DIAGNOSIS AND TREATMENT OF MELANCHOLIA.

IN THE PRACTICE OF PROF. TH. ZIEHEN IN JENA.

Translated by Dr. W. Alfred McCorn, Asst. Physician, Illinois Eastern
Hospital for Insane.

Melancholia is one of those psychoses whose gravity is not often enough appreciated in practice, and so serious calamities occur. In what follows will be briefly discussed the definition, frequency and etiology, the symptomatology, course, prognosis, and exhaustively the diagnosis and treatment, the latter with special reference to the danger of suicide. As to literature I shall be limited to such works and writings as are particularly fitted to broaden the practitioner's knowledge.

I. DEFINITION.

The definition of melancholia has not always been the same. We understand by melancholia to-day a psychosis whose chief symptoms are as follows:

1. A primarily dejected mood or depression.
2. A primarily retarded flow of thought, or thought inhibition (Denkhemmung).

The first symptom is never absent; the second may be temporarily hidden under special circumstances, to be mentioned later. The import of both symptoms needs no further explanation. I will merely state that the technical term "primary" means "not produced by other psychopathic symptoms." There is also a secondary depression and a secondary thought inhibition. When a paranoiac is dejected by the effect of persecutory ideas or voices, this dejection or depression is then secondary, for it is due to another psychopathic symptom, namely, sense deceptions with depressive ideas. We likewise know patients whose thought inhibition is secondary, in whom, for example, under the influence

of fascinating hallucinations, the flow of thought is markedly retarded. This is also secondary, because another psychopathic symptom, namely, fascinating hallucinations, is present. The depression and thought inhibition of melancholia are always primary. Still sense deceptions occasionally, and delusions more often, occur in the course of melancholia. But by studying the course and questioning the patient directly it is found that the dejection and thought inhibition had long preceded the sense deceptions and delusions, and also that the sense deceptions are merely an accidental, non-essential attendant symptom, and the delusions have been developed secondarily from the dejection in a manner to be discussed later, while the depression existed from the beginning of the disease, remains constant during its whole course, and is always proven to be primary by a careful psychological analysis.

The depression and thought inhibition of melancholia are confusedly co-ordinated. Each intensifies the other without it always being possible to decide whether the former depends more on the latter or the latter more on the former. In general, however, careful observation teaches that in most cases the depression occurs first, is more continuous and pronounced than the thought inhibition. Therefore melancholia is properly to be included among the affective psychoses, *i. e.* those psychoses whose primary symptom is a change in the emotions.

2. FREQUENCY AND ETIOLOGY.

The official statistics of insane hospitals are scarcely reliable for determining the frequency of melancholia, for, first, in the official reports melancholia is grouped with mania, paranoia, etc., under the caption of "simple psychoses," and second, melancholia very often runs its course outside of the hospital. To the local hospital, whose material was kindly placed at my disposal by Prof. Binswanger, there were admitted from January 1st, 1886, to January 1st, 1895, 160 female, *i. e.* 16.4 per cent., 78 male, *i. e.* 5.3 per cent., cases of melancholia.

These comprise only those cases which exactly correspond to the definition given above. Those cases in which neurasthenic or hysteric symptoms had preceded or still exist are included only when the typical symptoms, especially a constant motiveless de-

pression, exist. Sporadic attacks of anxiety occur often enough in neurasthenia and hysteria without one being justified in speaking of an added melancholia; whereas a constant motiveless depression is as foreign to simple neurasthenia as to simple hysteria, while morbid irritability is characteristic of the first and morbid instability of the latter. Then if in neurasthenia or hysteria a constant motiveless depression or anxiety exists, it is correct to assume that the neurasthenia or hysteria is complicated by a melancholia. I will later fully discuss the frequency, special etiology, treatment, etc., of melancholia developed on the basis of a hysteria or neurasthenia.

The preponderance of the female sex is not alone shown by the difference in the above figures, but also by the fact that pure, wholly uncomplicated, typical cases of melancholia form the chief contingent in the female sex, while among the male melancholiacs complicated, atypical cases are quite common.

The frequency of melancholia in general is not adequately expressed by these numbers. It remains to be considered that melancholia runs its course outside of a hospital quite often. Consequently I have determined the percentage of melancholiacs coming to me outside of the hospital with nervous and mental diseases. They amount to 7.2 per cent.

It is not uninteresting to compare the ancestry of melancholiacs with that *e. g.* of paranoiacs. This shows that the rural population furnishes an essentially larger percentage of melancholiacs than the urban, and that inversely the percentage of paranoiacs is greater in the latter.

The apportionment to the different ages is as follows according to the hospital admissions from 1886-1894:

	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	70-80
M.	2	9	2	13	13	2	14	11	4	0
W.	3	9	15	20	17	23	17	18	10	1

All periodical cases have been omitted from this table. Evidently melancholia has a tendency to occur in females in the fourth and fifth decades. In regard to the men my number is still too small, yet I might state that the 9 cases in the 5th lustrum were complicated with neurasthenia, with one exception. The majority of uncomplicated cases of melancholia in men occur

between the 45th and 55th years, according to my figures. On the other hand it is apparent that the recent proposition that melancholia is a "disease of decline" does not agree with the facts.

Of the causes predisposing to melancholia, hereditary taint heads the list, as shown by the following summary:

A. Male Sex.

Taint on the father's side was present in 17 cases (21.8%), strong in 14.¹

Taint on the mother's side in 13 cases (16.7%), strong in 12.

Taint indefinite as to which side² in 5 cases (6.4%).

Taint from the father and mother in 7 cases.

Taint was definitely excluded in 8 cases.

B. Female Sex.

Taint on the father's side in 27 cases (16.9%), strong in 24.

Taint on the mother's side in 33 cases (20.6%), strong in 27.

Taint indefinite as to which side in 15 cases (9.4%).

Taint on the father's and mother's side in 20 cases (12.5%), strong in 18.

Taint absent in 18 cases (11.3%).

In the other cases the statements as to heredity were so faulty and indefinite that heredity was questionable, yet I believe that among these cases there are considerably more untainted than tainted, as the gaps in the genealogy often were not great. In these cases which were above stated to be definitely untainted there was a complete genealogy including the grandparents, which I had investigated myself. Inebriety in the ancestors was proven in only five cases, still it is to be considered that this is often suppressed by the relatives. Homogeneous heredity is found very often. The father of 4 male melancholiacs and the mother of 4 others had had melancholia, likewise the father of 4 female melancholiacs, as well as the mother of 8 others (8.4% in

¹ I have called the heredity mild which is based on headache, anomalies of character, gout, diabetes in the father or mother.

² These are cases especially in which psychoses or neuroses were proven in one or more of the brothers and sisters.

toto). Still statistics show it when all these cases are collected in which melancholia or suicide can be proven in a blood member of the family; I have found 48 such cases (15 and 33), 22.2%. In one case 6 of the family had had melancholia and 3 committed suicide.

Besides heredity, *brain diseases in childhood* are predisposing. They were proven in 6 cases in the male sex and in 5 cases in the female. In 2 other cases a typical chorea minor had occurred in childhood. I demonstrated in 9 female patients a very mild congenital imbecility, *i. e.* dullness. Neurasthenia had preceded the melancholia in 11 male and 9 female patients, hysteria in 3 female patients. Migraine occurs very often among the personal antecedents of the female patients (10 cases, 6.3%). Finally it is known that the temperament affords a mild predisposition. In 15 female and 4 male patients such anomalies of temperament are proven; in these cases it is usually a matter of an extremely anxious temperament, rarely of an irritable one. Attacks of *pavor nocturnus* in childhood are reported.

Intoxications seem to play a small part. Chronic alcoholism occurred in 5 men and 1 woman. Abuse of tobacco was present in 3 male patients.

The factor of *exhaustion* has a bearing in its different forms. Sexual excesses, especially excessive masturbation, were present in 18 cases (12 males, 6 females). Frequent labors and protracted lactation played a decisive role in 2 cases; severe hemorrhages (*e. g.* climacteric metrorrhagia or post-partum hemorrhage on the 11th day after labor) existed in 3 cases. Intellectual and physical stress is of importance in 27 cases (6 men, 21 women). Stress is not alone and principally effective as such, but it acts by virtue of the pernicious emotions combined with it (feeling of responsibility, insufficiency, etc.). In 3 cases I observed a melancholia immediately follow dieting for obesity.

I found *insolation* effectual in one case, *head injuries* in 8 cases (6 men, 2 women).

During this period I have observed only 4 cases of melancholia of *pregnancy*, 11 of *puerperal melancholia*. In the latter the puerperal state acted very diversely; first it was the intense emotion combined with a dishonorable labor (3 women), then hemorrhage in the puerperal state, finally the exhaustion from frequent

labors, etc. The influence of lactation has already been mentioned.

Gynecological diseases and improper or prolonged *gynecological treatment* have evidently been of influence in 7 cases. A direct connection with the climacteric was possible in 8 cases (2 cases of climacteric metrorrhagia).

Other physical diseases play a subordinate part. As a rule the physical disease as such is not the effectual factor, but it usually acts by virtue of the combined emotions of worry, fear, etc. The following compilation embraces both sexes:

Panaritium	1 case
Carcinoma mammae	1 "
Carcinoma uteri	1 "
Gonorrhoea	1 "
Cystitis	2 cases
Ulcus ventriculi	2 "
Gastric catarrh	4 "
Vitium cordis	2 "
Acute articular rheumatism.....	3 "
Influenza	5 "
Syphilis	5 "
Pulmonary tuberculosis	1 case
Nephritis	1 "
Diphtheria	1 "
Chronic pharyngitis	1 "
Eczema	1 "
Diseases of the eye.....	1 "

All the previously cited causes—with the exception of heredity—are of less importance than *mental shock*. I find among the male patients no less than 29 (37%) and among the female 71 (44.4%), in whom a single mental shock or protracted emotion has been of decided influence. This factor is often improperly depreciated. I have always especially considered whether a morbid depression had preceded the mental shock. In the above cases the latter did not occur. The emotions which produce melancholia may be of the most diverse kind, yet in etiological statistics certain emotions recur with striking frequency. Death and serious illness of a relative (child, husband, etc.) head the list. Over-

exertion in the care of the sick occasionally co-operates, yet the chief factor is usually the worry, anxiety and sorrow. A very large number of the cases depended on the emotions incident to the betrothal. It is either the bride or bridegroom who is in doubt whether they "have chosen correctly," or whether they "deserve the happiness," whether they are equal to the demands of married life, etc.; then it is the mother, in whom doubts arise whether she did not give her consent to her daughter's engagement too quickly, etc. Nuptial melancholias on the contrary are much more rare; I have seen only one marked case. Of greater etiological importance are the emotions which are coincident with a material change in the position in life or mode of life (18 cases). Change to another place, in the occupation, a simple change of residence, may lead to an outbreak of melancholia in the predisposed. According to my experience, protracted pecuniary worry is of less importance than a single financial loss. One of the cattle dies, a cow calves prematurely, a debtor fails and the melancholia breaks out. Simple fright is quite often effectual. A fire, even though it causes little or no loss, and similar events, I find repeatedly recorded.

Hence it is always certain that melancholia, as well as the majority of the other psychoses, is a disease with several causes. Two or more of the factors cited usually co-operate. The trio is very often found, *e. g.* hereditary taint, stress, mental shock, etc.

3. DEVELOPMENT.

According to the intensity of the symptoms, two chief forms are differentiated: melancholia gravis and melancholic depression or hypomelancholia. The following description refers exclusively to melancholia.

Occasionally the outbreak of melancholia is peracute. In periodical melancholia (see below) especially I have occasionally observed a very sudden invasion and ascendancy of the disease, in two cases accompanied by rigor. In the majority of cases a longer or shorter prodromal stage precedes; sleep and appetite lessen, occasionally a motiveless depression occurs, the patients now and then complain of mild thought inhibition. Feelings of oppression in the chest appear as precursors of the later anxiety. The transition from the prodromal stage to the completely devel-

oped disease is usually abrupt. It starts from an experience or even an almost accidental thought of the patient. The experience inducing the definite outbreak is often entirely harmless. I knew a woman who had lost her child and since then the prodromal symptoms above cited have been present. One afternoon she attended a tea-party; her hostess gave her the last piece of cake and said, "The rest for the wicked." The woman well knew that this is a jocular expression, but she took it in earnest and referred it to herself especially. Intense anxiety and delusional self-accusations occurred the same day; the disease had passed from the prodromal stage to the crisis at one bound. From then on its course was that of typical melancholia. Another patient had had a uterine retroflexion for many years. At the climacteric pains and mild paraesthesia occurred in the legs; she then took gynecological treatment. As it did not relieve her troubles she worried a great deal, slept poorly, lost interest in her household duties and ate little. One day she again consulted the gynecologist, who said to her, "If she thought her spine was affected her symptoms would be entirely different." Anxiety soon supervened; she read an article in a popular work on diseases of the spinal cord and found that they could be produced by masturbation. It at once recurred to her that she had masturbated when a girl, and thus arose the hypochondriacal delusion of a spinal trouble and exaggerated delusional self-accusations. From that day until her recovery the anxiety and delusions continued. There are other cases in which the prodromal stage passes very gradually into the crisis; the depression becomes more continuous, attacks of anxiety become more frequent and more intense, and the characteristic delusions of melancholia are found to attend the change in the emotions.

4. SYMPTOMS OF THE CRISIS.

The chief stage or crisis of melancholia is characterized, as has already been stated in the definition, by two principal symptoms—depression and inhibited association. It is further characteristic of *melancholia gravis* that anxiety is added to the simple depression, and that the former of itself often gives rise to definite secondary delusions. In simple melancholic depression anxiety and secondary delusions do not occur.

The *depression* is always continuous, but its intensity often varies within quite wide limits. The *anxiety* is also usually continuous, but if continuous it is paroxysmally intensified in the majority of patients. Therefore attacks of anxiety may be spoken of in most cases. They occur especially in the morning and after meals (very often during the repose after dinner), somewhat more rarely in the evening and at night. Occasionally they occur directly on awaking. While simple depression as a rule is not accompanied by physical sensations, they are rarely absent in anxiety. In many cases the patients say they feel the anxiety in the cardiac region, over the whole chest or in the gastric region, and have the feeling of oppression; this form of anxiety is called *præcordial fear*. Others feel the anxiety in the head or throat especially. In the first case I have heard the statement that the anxiety is attended by a feeling of dizziness or vertigo. The usual attendant physical sensation of laryngeal anxiety is that of morbid constriction about the neck. It is very often said that the anxiety in the chest rises to the head like a hot current. Localization of anxiety in the abdomen is not at all rare. In one case in which worry about an entirely harmless and almost cured cystitis had induced the melancholia, the patient always very positively referred her anxiety to the region of the bladder. Localization of the anxiety in the extremities is more rare. The patient mentioned above with retroflexion felt her anxiety in the lower extremities especially. In one case—without evident cause—I observed the anxiety localized in one arm. The duration of the individual attacks of anxiety varies within the widest limits, it may last for a minute or for hours.

In many patients the depression is accompanied by anxiety from the first, in others the depression with anxiety is preceded by a stage of pure depression (without anxiety).

The *inhibited association* is not always equally marked. It is manifested as well in retarded flow of thought as in retarded voluntary movements. Only the movements and ideas induced by the anxiety are unaffected by the generally inhibited association. This explains why patients who do not or only very slowly answer the simplest questions as to themselves, the multiplication table or history of their native land, and do not or very slowly perform the simplest movements required of them, fluently complain

of their intense anxiety for minutes or hours, throw themselves about or commit suicide with the greatest celerity.

The *delusions* of melancholia are secondary, in that they occur subsequently to the emotional disturbance (depression and anxiety), and depend on it, the anxiety especially. They have been called efforts to explain the anxiety. If the melancholiac has the delusion of having committed murder, the psychological process is thought to occur as follows: the patient notes his anxiety, reflects that the guilty are usually anxious, and so concludes that he must be guilty. Yet in reality the origin of the melancholiac's delusion is rarely so logical. Patients occasionally say they feel a "heart pain as though they had a murder on the conscience," and it is then observed that such patients scrutinize their whole past life to see whether they have committed a crime; they light upon some trifling event, which under the influence of their anxiety convinces them more and more of a crime. Still in many cases this unconscious logic is absent. The patient has an accidental experience, he hears something said, observes something about his body, etc., or has a fancy he would not have regarded at all in health. In his morbid depression and anxiety he transforms the assertion or fancy into a delusion. According to my observation this is the most common origin of melancholic delusions. A patient has lost her child. She grieves over it long and deeply. The prodromal symptoms of melancholia are developed more and more. She must repeatedly think about the child's illness, continually wonder why it should have terminated so sadly; very naturally it occurs to her: was something done wrong or neglected? In a normal state of the emotions she would have immediately repelled these questions; but owing to her morbidly changed state the thought at once arises: did you give the medicine promptly? In a normal state of the emotions she would have at once said, the thought is perfectly silly, for if the medicine had once been given behind time this alone could not have caused the fatal termination. Owing to her morbid condition the idea is grasped and retained without reflection. Anxiety takes possession of the thoughts, fashions them into delusions and will not relinquish them. All arguments of the physician and relatives are as powerless as the patient's normal memories. The delusion, by virtue of its foundation on a pathological state of the emotions,

is intensified. When the latter become normal the delusion disappears.

In the course of the disease two states may readily be differentiated: a first of pure depression with anxiety, and a second of depression and anxiety with secondary delusions; then again a stage of pure depression is observed in which anxiety is only sporadic and mild, and a second stage of almost simultaneous invasion of aggravated and intense anxiety with secondary delusions. In the latter case the first stage often appears like a prodromal stage in the sense above stated. Finally it needs to be especially emphasized that not every case of melancholia gravis must lead to secondary delusions. Occasionally a well marked melancholia with intense anxiety and depression is observed without any secondary delusions.

The *import of the delusions* varies greatly, the following being the most common:

- a. The delusion of having committed unpardonable sins.
- b. Hypochondriacal delusions.
- c. Delusions of impending poverty.

The delusion is often directly related to the cause of the disease. This includes *e. g.* the delusional self-accusation of having neglected the care of a sick and deceased relative. The hypochondriacal ideas are usually joined to an accidental observation as to one's own body. I saw a patient who joined to an angina the delusion of "incurable syphilis"; he had in fact been infected with syphilis many years before, but at this time it was an entirely simple angina. Assurances were of no assistance. The complete cure of the angina did not convince him. About every ten minutes he looked into his mouth with a mirror and always believed he found white patches, etc. The delusion disappeared when he recovered from the melancholia. The delusion of impending poverty is often similarly joined to a loss of property, which has been the exciting cause of the disease.

The number of delusions in the single case varies greatly. Many melancholiacs during the whole course of the disease have but one delusion, *e. g.* of having incurable tuberculosis or of having sinned against God, etc., and the delusion is so limited that the patient interprets many events from its standpoint. I knew a patient who claimed to have intestinal erosions and con-

stantly believed she was about to die. If the nurse looked at her she thought it was to see if she was dead. As her pillows were once placed somewhat lower than usual she fancied they would thus put her in the position of a corpse, and many others. Other patients have many, even numerous delusions; some patients present the most diverse self-accusations, or—if more rare—fancy they have a fatal disease. The combination of delusions of sin and poverty (*e. g.* in masturbators) occurs very frequently. An intensification and remission of the delusions are observed to depend on the variations in the anxiety's intensity.

Occasionally others are added to the above delusions, which are complements of them. I have called these complementary delusions. They are in part complementary delusions of grandeur and in part of persecution. The first are developed according to the psychological law of contrast. To very forcibly display his momentary fault, sickness or poverty, the patient claims he has formerly been extremely good, healthy or rich. In a theological candidate 23 years old I observed complementary ("contrasting") delusions of grandeur reminding of the delusion of being the Messiah. He expressed himself as follows: "My life is ruined. I have yielded to the most terrible temptations. I have fled from God. I feel death in my breast. I am the son of depravity, depravity itself, I am the lie. I am the nameless who could have saved the world and have done the opposite. I have cursed myself. The curse rests on me. I become ever smaller. That is the curse of the evil deed. We now would all have been happy had I improved my omnipotence. I was the Holy Ghost. I have killed the Holy Ghost," etc. A female melancholiac said very much the same to me: "I was an angel and now I am the evil spirit." The complementary delusions of persecution are still more frequent. The patient *e. g.* accuses himself of being a perjurer. Eight days later he claims the State's Attorney has issued a warrant for him, the police are on his heels, etc.

As a rule the delusions are not of silly import, in so far as the patient draws correct conclusions from them and is often able to very shrewdly justify them by plausible reasons. Only when congenital imbeciles have melancholia, as occasionally occurs, the congenital intellectual defect naturally is often expressed in their delusions.

In those who have attained full mental development the melancholic delusions are occasionally so extravagant that one might be inclined to assume an intellectual defect, if the reasons alleged for the delusions in these cases did not show the integrity of the intelligence. I cite *e. g.* the following delusions of a melancholiac: "I have betrayed the Virgin Mary. I have betrayed Adam and Eve. I have also betrayed the fields. (In what respect?) I have grazed on the fields which did not belong to me. I have betrayed Jesus and the twelve Apostles. I have abused everything. I have tasted of all the trees of the world. Adam and Eve tasted of only one. I have taken everything from the people. That (pointing to the light of the lamp) means me. The moon and the sun show that I have betrayed them. The world is lost. The sky falls. For I am guilty." French authors have very aptly called such extravagant delusions *délire d'énormité*. Finally the idea of being transformed into animals, the so-called zoanthropic, is occasionally observed. I know a patient *e. g.* who has twice been admitted to the local hospital for typical melancholia. In the first attack he claimed to be changed into a dog; there were also delusions of sin.

With respect to the chief symptoms—depression and anxiety, inhibited association and secondary delusions—the other psychical symptoms are less prominent. *Hallucinations* and *illusions* are not constant or even frequent symptoms of melancholia. They are observed in about a tenth of the cases. They occur late in the disease and only occasionally. Voices are the most common, and especially those the patient fancies he hears within him, in his head, breast or abdomen. Their import usually corresponds with the motives, *i. e.* the delusions arising from them. So "the dear Lord" says *e. g.* to a patient, "You must take your life before morning." The sensory intensity of these voices is not very great usually. The patients are often unable to decide whether God "has merely put the words in their thoughts," or they have actually heard them. Visions (pale faces, ghosts, devils, etc.) and deceptions of the other senses are still more rare.

The *external appearance* presented by melancholiacs is not so uniform and homogeneous as might perhaps be expected from the constancy of the principal symptoms. This owing to the fact that the anxiety very differently affects the motor functions

of different individuals and occasionally the same individual at different times. It intensifies the existing inhibition or inversely produces violent motor excitement, the agitation of anxiety. The inhibition may occur either simply as general resolution or be combined with general spasm of all the muscles. By reason of this diverse motor reaction to the emotional disturbance three forms of melancholia have been differentiated, namely:

1. Melancholia passiva: resolution prevails.
2. Melancholia attonita: muscular spasm prevails.
3. Melancholia agitata: agitation prevails.

In melancholia passiva the patient lies in bed inertly. If an extremity is raised it falls almost like the limb of a corpse. In the most severe case the patient executes no voluntary movements, and in all cases very slowly and apathetically. The most diverse states of spasm are observed in the more rare cases of melancholia attonita. A motionless recumbent posture on the back is very common, while the head is raised spasmodically from the pillow. The patient remains in this posture for hours. The extremities are rigidly extended or flexed. Voluntary movements are even more rare than in the passive form. If movements are required of the patient the spasm ceases for a moment at best, and finally the patient convulsively executes a simple movement required of him. Passive movements meet with strong resistance. The so-called *flexibilitas cerea* (waxy flexibility) is occasionally observed, *i. e.* the patient's limbs retain any position given them for a time unchanged. In passive melancholia the physiognomy is simply sad, in melancholia attonita it is markedly anxious. The movements of speech in both are just as rare and slow as all other movements. In melancholia attonita absolute mutism of days or weeks' duration often occurs. Melancholia agitata is exactly the opposite. Here the anxiety is stronger than the inhibited association, consequently the most manifold expressions of anxiety occur. In the simplest cases they are limited to low or loud complaints. The patients often bite or pull the tips of their fingers. Other patients scratch and rub sores on the body.* Others, so to speak, milk the fingers of one hand with the other. Some wallow about restlessly, others sway

* These rubbing motions of anxiety may lead to masturbation. Five of the statistical cases presented such masturbation of anxiety.

the upper part of the body for hours. In the latter case the arms are often implicated in such a way as to give rise to the motion of rowing. Many patients move their legs especially. Occasionally it results in an almost rhythmical alternation of flexion and extension in the large joints of the legs. I have occasionally observed an almost rhythmical alternation of flexion and extension in the joints of the foot, similar to dorsal clonus. Very many patients cannot remain in bed owing to their anxiety. They then wander about restlessly, either complaining or crying. This is called the frenzy of anxiety. Such patients perform movements required of them more often and quicker than patients with the passive or spasmodic forms. Filthy habits are much more common in the latter than in the former. In all three forms food is partaken of very poorly. In the passive and spasmodic form the inhibition interferes with eating; in the agitated form the anxiety does not afford the patient the requisite quiet to eat. Besides, in all three forms delusions often cause partial or complete refusal of food. The patient says: "I am too wicked, I must not eat," "I am too poor, I cannot pay for what I eat," or "I am too sick, food does not agree with me," or "food will no longer benefit me." Suicidal attempts likewise occur in all three forms. They are relatively rarer in the passive form, yet they occasionally occur. They are the most dangerous in melancholia attonita, because the attendant does not expect them in view of the patient's apparent calmness, and so the supervision is readily evaded. In these patients a severe attack of anxiety may very suddenly overcome the inhibition, and a suicidal attempt occur very precipitately. It is to be emphasized that the differentiation of a passive, agitated and spasmodic form is by no means sharp. In many cases a change in the motor condition is observed. Passive, agitated and spasmodic conditions follow each other. Finally, in many mild cases the voluntary movements are not essentially lessened, but on the other hand the agitation is not very intense. Suicidal attempts also occur in such cases quite often.

The anxiety may occasionally cause acts of violence. I recently observed a 60 year old emeritus professor who in a paroxysm of anxiety attacked the attending nurse, seizing her by the throat and choking her. The patient admitted he wished to do

away with her so as then to take his own life. He afterwards recovered completely. Another case came to my knowledge in which a melancholiac suddenly kicked his attendant so hard that he fell senseless, then broke a window and with a piece of the glass severed his radial artery. He died from hemorrhage. It has been frequently observed that mothers who have melancholia kill their children in an attack of anxiety. Incendiarisms have also been observed of melancholiacs (*e. g.* in young servant girls with melancholia). Very indefinite anxious ideas are usually the incentive: all is lost, the world is destroyed, all must perish, etc. A definite idea is more rare: I will save the children from starvation, they shall not be as wicked and miserable as I am, etc. A suicidal attempt usually immediately follows such an infanticide or incendiarism.

Physical symptoms are very rarely absent in melancholia. Sleep is often very poor, and may be entirely absent in the crisis of the disease.

Appetite and hunger are often entirely absent. Without abstinence and without agitation the nutrition is generally very materially lowered. The gastric juice is often, the saliva frequently lessened. A stubborn constipation is almost always present. The bowels may not move for two weeks. The tongue is almost always heavily coated. Intense *foetor ex ore* often exists.

In the passive form the respiration is often retarded. A deep inspiration is very often observed as expression of the anxiety, owing to the attendant sensations of oppression. In the agitated form the respiration is irregularly accelerated, often gasping or wheezing. In one case I have counted 150 respirations per minute for a short period.

In the passive form the heart's action is usually retarded. In one case the pulse sank to 48. In severe attacks of anxiety, especially in the agitated form, it is accelerated. The peripheral arteries are usually much contracted, hence the cold hands of melancholiacs. Amenorrhœa is observed quite often.

The composition of the urine does not seem to be essentially changed.

Neuropathic symptoms strictly are entirely absent. Only when complicated with neurasthenia or hysteria the symptoms common to these diseases must be present.

5. TERMINATION.

The course of typical melancholia is usually continuous, rarely remits, and usually lasts 4 to 6 months—provided the treatment was seasonable and proper. Occasionally, especially when the treatment was late and improper, the disease may last 9 months, 1 year, and even longer. Those cases which present few intense symptoms often require a particularly long time for recovery. The transition into convalescence is occasionally almost critical. In the severest cases this is not rare. Occasionally convalescence is simultaneous with the re-establishment of the menses absent at the height of the disease. In other cases the delusions, emotional disturbances and inhibition gradually subside. Mild exacerbations are frequent during convalescence. A complete relapse rarely occurs immediately after or during convalescence.

A post stage is often developed in the sense of the so-called reactive "hyperthymia," *i. e.* a mild exhilaration increased to morbidness. The patients are inordinately cheerful and active, talk, work and scheme more than when they were well. In a few days or weeks this reactive emotional disturbance disappears.

Besides complete recovery the following terminations are observed:

1. In recovery with defect.
2. In death (intercurrent diseases, suicide).
3. In secondary dementia.
4. In chronic melancholia.
5. In secondary paranoia.

Under hospital treatment about 90 per cent. of all cases recover completely. The actual percentage of recoveries is more unfavorable, simply because the relatives do not send them to the hospital early enough or the patients are removed too soon. Of five cases belonging to the latter category I definitely learned that the patients later died by suicide. Outside of the hospital unfavorable terminations are much more common, especially the fatal one by suicide. Of the 238 melancholiacs admitted there were 38 in whom an almost successful suicidal attempt had immediately preceded the admission. We do not have reliable statistics of successful suicides of melancholiacs outside of the hospital. In the hospital one case committed suicide in spite of all the

precautions. Of the intercurrent diseases pneumonia is especially dangerous to senile melancholiacs (3 fatal cases).

Recovery with defect is a more rare termination. The emotional disturbances, inhibitions and delusions disappear, but a careful comparison shows that the patient has sustained a slight intellectual injury. Complicated ideas and combinations of judgment are lost to him by the disease. This slight defect usually escapes entirely the laity. Equally rare is the termination in secondary dementia. Here a progressive intellectual enfeeblement occurs, which may result in complete dementia. The termination in chronic melancholia is somewhat more frequent. In these cases memory and judgment remain intact. The emotional disorder only partly disappears. Violent attacks of anxiety become less and less frequent, being replaced by a morbid complaining. Thought inhibition is lessened to a certain degree, but a lasting inhibition still controls the actions; the patients are irresolute and apathetic and so incapable of action. Many indulge in monotonous complaining and fruitless self-accusations. Finally the termination in secondary paranoia is not common. I have observed only three such cases, two being included in the above cases. This termination is characterized by numerous hallucinations and persecutory ideas occurring gradually or suddenly, while the primary emotional disturbance, the thought inhibition and melancholic delusions become more and more dim. The intelligence remains intact. Of the three cases I have seen two pass into chronic hallucinatory paranoia; one in whom the transformation of the disease type occurred very suddenly, recovered completely.

From what has been said it is seen that the prognosis of melancholia in general is very favorable. Why in some few cases termination with defect, secondary dementia, secondary paranoia or chronic melancholia occurs instead of recovery, cannot to-day be definitely stated. Occasionally an improper treatment or lateness of proper treatment is really responsible. Hereditary taint appears to be unimportant in the prognosis with respect to the single attack. Individuals who were irresolute and somewhat dull before the disease seem predisposed to a termination in chronic melancholia. Severe melancholia occasionally recovers very quickly in debilitated individuals.

The prognosis is significantly affected unfavorably by the tendency of melancholia to relapse. Not a few completely recovered melancholiacs succumb to melancholia again from the effect of corresponding pernicious agencies. The prognosis of this relapse is in itself no worse than that of the first attack. The relapse often occurs 10, 20 and even 30 years later, occasionally in 6 months or 1 year. This depends especially on the effect or non-effect of the etiological factors, which were enumerated above. The frequency of relapse is shown the most strikingly by the fact that among the 238 cases there are 34 in which one attack of melancholia preceded, two in 13, and 5 in which more than two attacks had preceded. Periodical melancholiacs (see below) are not included. These figures show that relapses occur in almost 22 per cent., and this evidently would be still higher if the statistics embraced a longer period.

6. VARIETIES.

The varieties known as melancholia passiva, attonita and agitata have already been described. On the basis of the character of the secondary delusions a melancholia hypochondria, religiosa, etc., have often been differentiated. The differentiation of several other varieties is more important, which will now be described.

a. Melancholic Depression or Hypomelancholia.

This is the form of melancholia in which depression and inhibited association are the chief symptoms. The anxiety characteristic of melancholia gravis, as well as the secondary delusions, are entirely absent or occur only now and then without great intensity. For the practicing physician it is just as important as the chief form, because very many of these cases never reach the hospital, but remain at home under the family physician's care. In fact, among the 238 cases which were received at the psychiatric clinic during the period stated, there were only 5 cases of hypomelancholia. All 5 were men between 30 and 60 years of age. My experience outside of the clinic confirms the decided preponderance of the male sex. The special cause of the attack is usually overwork and mental excitement (change of occupation, loss of property, engagement to be married, etc.). The

development is usually quite slow. The whole world appears to the patient in gloomy colors. His occupation, his family, his favorites are repugnant to him. His regard for occupation, cleanliness and personal appearance seems extinct. The inhibited association is chiefly manifested in a retardation of mental work. These patients answer simple questions quite quickly, but it is extremely hard for them to write a letter, read a book or fully comprehend a long train of ideas. I have the autobiography of such a patient, wherein he complains that he now cannot do the work in eight hours he once did in one. Yet the simple individual movements of these patients are not inhibited—contrary to melancholia gravis; whereas all complicated, co-ordinated, continuous motor acts are perceptibly retarded. This is noticeable in their writing. The patient's thoughts are not only retarded in his writing, but the writing itself is less easy. Tradespeople spontaneously complain that their writing is less legible. A comparison of the writing before the disease with that of the present confirms this. This symptom is very marked in the patient's gait; they drag their feet, take short steps, walk slowly. From the emotional disturbance and inhibited association another symptom arises, which is usually noticed by the laity—their irresolution or abulia. The depressive tone of feeling affects their self-consciousness. In melancholia gravis it induces the most pronounced micromania (delusions of sin, sickness, poverty); in hypomelancholia it only causes a pathological lack of self-confidence. Yet, in conjunction with inhibited association, this fully suffices to hinder all energetic action. The patients cannot make the simplest decisions. In dressing they cannot choose between their garments, they are unable to make the simplest decisions in their house-work. I know patients who could not, or only after very prolonged hesitancy, decide to go into a store and ask for something. Decisions in business (professional decisions, etc.) are impossible. If the patients have finally reached a decision they immediately regret it, to again at once regret having recalled it. Letters, which have been written after many efforts, are repeatedly destroyed, and finally, if they are fortunate enough to reach the letter-box, are reclaimed from the post. In this state of affairs it is no wonder that such patients neglect their toilet, house-work, occupation, fail to answer urgent letters or

meet their appointments, no longer keep their books and accounts, remain in bed until noon or even longer, etc. The physical symptoms are very trifling. The sphygmograph occasionally shows a slight contraction of the peripheral arteries. Gastric disturbances are common, as well as constipation. Occasionally sleep is wholly undisturbed. The patients sometimes complain of mild head pressure.

The course is always very protracted. It often extends over more than a year. The termination is recovery or—more rarely—a transition into chronic hypomelancholia. After a very protracted course recovery occasionally occurs in a few days. The tendency to relapses is very great.

b. *The Apathetic Variety.*

It may occur as well in melancholia gravis as melancholia levis. The patient's depression and anxiety are mere morbid apathy. The patient's fundamental feeling is motiveless dejection with or without anxiety, but they complain especially that their normal tone of feeling and the positive and negative are gone. Their nearest relatives have become entirely indifferent to them. They complain that they "have a stone instead of a heart in their breast." They reproach themselves that even the news of a death leaves them perfectly indifferent, and on this basis found new delusions of sin. In their external conduct these patients usually present the picture of melancholic depression or melancholia passiva. The prognosis of this form is very favorable; the course is usually somewhat more protracted than in melancholia gravis.

c. *The Hallucinatory Variety.*

In typical melancholia hallucinations do not occur at all or only sporadically or accessorially. In the hallucinatory variety delusions or hallucinations are more frequent and indicative of the disease type and its course. Strong hereditary taint and advanced age are the most predisposing to this form, yet it is not especially common. Among the 238 cases there were only three of this variety.

d. *With Imperative Conceptions.*

In this variety imperative conceptions occur during the course of the melancholia. The impression exists that they replace the

melancholic delusions and occur with them. A young girl who became ill with melancholia at the time of her wedding had the imperative conception that she must call her father a "rascal." She could not get rid of the idea during the greatest part of her melancholia and united various self-accusations to it. On recovery or just before it the imperative conception disappeared completely. In a pregnant melancholiac I observed the imperative conception that she must kill her children. The patient was fully conscious of the absurdity and criminality of such action and the morbidity of the thought, but was unable to suppress it during her melancholia. I have seen suicidal thoughts occur in two cases in form of a typical imperative conception during the course of a melancholia. In another case arithmomanic imperative conceptions existed. Finally in one of the latter the patient, whose melancholia had immediately followed the death of her father, could not get rid of the imperative conception that she had poisoned his sausage and so caused his death. Here it was not a question of a delusion, for the patient knew very well that her father had died from apoplexy and admitted the absurdity of her idea, yet it imperatively continued as long as the melancholia and caused the existing anxiety to be increased in spite of her better knowledge. The prognosis of this form with respect to complete recovery seems to me less favorable.

e. The Neurasthenic Variety.

One may differentiate between a melancholia which occurs in a patient who has long been a neurasthenic, and a melancholia which, besides the typical symptoms of melancholia, present those of neurasthenia also. In the first case it is a matter of complication of neurasthenia with melancholia; in the latter a mixture or transition type between neurasthenia and melancholia. I regard the first as very rare, the latter as quite frequent, especially in males. Among the 238 hospital admissions I find 12 cases; in private practice they are much more common. The peculiar mixture of melancholic dejection with neurasthenic irritability is the most characteristic. Now the first is most prominent, then the latter. The course is usually tedious. Quite often it follows a chronic neurasthenia.

f. The Hysterical Variety.

Here it is always the matter of the complication of hysteria with melancholia. The hysteria has long existed, and by the effect of special pernicious factors a melancholia is added. It is not of frequent occurrence. Among the 238 cases there were only two. Both recovered. During the melancholia the symptoms of hysteria remain almost unchanged. The lability of the disposition often penetrates the melancholic depression.

g. Periodical Melancholia.

This variety, characterized by its course, has been too little considered. Among the 238 melancholiacs there were only 5. Six other cases I have seen and treated privately. I am convinced that the majority of these cases run their course outside of the hospital. The regular recurrence of a melancholic attack at approximately equal intervals is characteristic. Usually it is of a mild or mediumly severe type. In one case the attack occurred at 11, but usually in middle life and especially at the climacteric. Of my 11 cases 4 were men. The duration of the attack and the interval vary greatly in different cases and are not always the same in the same case. A post stage of days, weeks, even months is not rare. The attacks most commonly occur at intervals of about a year. Under very improper treatment the interval between two attacks may occasionally disappear, *i. e.* the first attack is not over before the following begins. It is remarkable that in the first half of the interval, and even later, intense emotions do not cause a recurrence, while toward the end of the interval a relatively mild emotional shock or other injury induces the new attack. Quite often the new attack occurs without apparent cause. Delusions are often wholly absent; when present they are usually approximately the same in each attack. In spite of careful investigation I was unable to prove hereditary taint in 3 cases. In the other cases it was scarcely as strong on the average as in the non-periodic tainted cases. The outbreak of the individual attack is often peracute. In one case it was attended by glycosuria. The prognosis of the individual attack is very favorable; the prevention of further attacks always fails. By careful regulation of the mode of life it is possible to postpone

the impending attack. The further development into circular insanity occurs rarely or not at all. In one case mania once followed a specially severe attack of melancholia, as in periodical mania a melancholia occasionally follows a specially severe attack of mania. The post stage of reactive hyperthymia may occur, but is very often absent. In one case the periodical melancholia had existed 37 years.

7. DIAGNOSIS.

a. *Indicative symptoms.* Many cases of melancholia will be overlooked by the physician because he does not consider the possibility of a psychical disease. The physician regards the patient's depression as the natural consequence of existing physical troubles, a past or existing mental shock from deaths, etc. As a rule, however, a persistent dejection, if it seems to have a cause, should never be assumed to be physiological without further investigation, but the possibility at least must always be considered that a melancholia exists. Other symptoms, which sometimes cause astonishment and should always awaken a suspicion of melancholia, are the following: marked neglect of the toilet, business cares and household duties, restlessness, retarded mental functions, etc. A melancholia will not always be the cause of these symptoms, but often of another psychosis or of no psychosis; still they often enough depend on melancholia and so imperatively demand consideration in this respect. The suspicion naturally becomes more certain when there is no cause for the dejection, when the patient complains of his motiveless anxiety, when he utters groundless self-accusations and has ideas of poverty and hypochondriacal fancies. Still a melancholia does not always exist (see differential diagnosis), but very often. The physician who does not now examine as to melancholia and give corresponding instructions commits just as important and grave an error as he who examines a woman in labor without disinfecting his hands. In both cases he jeopardizes in an equal manner a person's life by gross neglect. Here suicide, there puerperal infection threaten in about an equal degree.

b. *Method of diagnosis.* I assume that the physician has found a motiveless, or at least an insufficiently motivated, persistent dejection in a patient. How can he now determine whether real

disease and whether melancholia actually exists? I may in a general way recommend the following series of questions. The answers to be expected, if melancholia exists, I will always subjoin.⁴

Are you gloomy? The melancholiac will always answer yes; a concealment of the disease symptoms is very rare in melancholia. It is then best for the next question to be: are you always dejected or are you occasionally cheerful? The melancholiac admits a constant dejection. At the most in mild cases he says he can occasionally be somewhat cheerful, yet it does not come from his heart, or something similar.

Are you anxious? If the patient suffers from melancholic depression he will answer in the negative. If melancholia gravis exists he will answer affirmatively. As a precaution at least it is to be asked: *have you of late (or for weeks or months, as long as the depression existed) occasionally been anxious?* It is to be remembered that the anxiety of melancholia often occurs paroxysmally.

Then it is best to immediately ask: *where do you feel the anxiety?* Many melancholiacs do not admit a definite localization, whereas some expressly state the cardiac region, the head or abdomen, etc. (see above), as the seat or location of the anxiety.

Why are you sad? Why are you anxious? These questions are of decisive importance. The melancholiac either says the dejection and anxiety have no cause ("come of themselves") or he ascribes his dejection and possibly his anxiety to the mental shocks preceding the disease (death, loss of money, etc., see etiology), or he refers the anxiety and dejection to a fancied crime, disease or poverty. The significance of the first answer is evident; if the patient knows no cause for his dejection and anxiety, they are at any rate characteristic of melancholia, primary depression and anxiety. If the patient makes the second answer, i. e. if he refers his dejection to mental shocks which have

⁴ Of course these questions are somewhat schematic. They will have to be changed somewhat to correspond to the individual case and position of the patient, etc. First of all, question slowly as to the thought inhibition and wait patiently for the answer. Possibly the question will have to be frequently repeated or another question interjected: did you understand my question?

actually preceded the disease, then these mental shocks must be carefully inquired into, either through the patient himself or his relatives. It is then to be considered whether the existing dejection corresponds in its duration and intensity to the unfortunate event or exceeds the physiological limits. So the relatives should be asked as to how the patient formerly behaved under like circumstances. It will often enough be learned that in similar cases he has been somewhat dejected for a time, but never so long or so intensely. Ask the patient: *are you sad only when you think about this misfortune, or otherwise?* The patient often answers very correctly now "all is gloomy to him." If, besides the dejection, anxiety also exists, the stated misfortune only suffices to cause the first, his anxiety is without a motive. The patient's attention can be called to this gap by saying to him quietly: *I well appreciate your dejection, but why are you anxious?* Many patients then admit its lack of foundation, and so the primary emotional disorder characteristic of melancholia is proven. If, finally, the patient cites his crimes, sickness or poverty as a cause, it is to be determined whether his self-accusations, his fear of illness or his financial worry have an actual foundation or not. In regard to the self-accusation, an inquiry of the relatives quickly settles the matter usually. Still in many cases it is better to let the patient relate the stated circumstance in all its details (frequently the patient's delusion is thus disowned) and he at once admits "it seems to him so in his anxiety." Such a confession may often enough be drawn out of the patient by energetic questions, to be again recalled in the next severe attack of anxiety. As above stated the self-accusation is often united to an actual occurrence and represents only an exaggeration of the latter (for examples see above). This exaggeration is the most easily determined by letting the patient relate all the details of the event which has relation to it. The fact, which is the basis of his fear of disease, is ascertained by a careful physical examination. In case it is a melancholiac's fear of disease, the glaring disproportion between the actual condition and the patient's solicitude will quickly show that the latter is pathological. We proceed in the same way in regard to complaints of poverty. The patient is induced to state his financial condition in all its details, and his statements are verified by questioning his rela-

tives. If melancholia exists the fear of poverty is shown to be wholly unfounded or exaggerated.* Thus is it determined that the person's ideas of guilt, sickness or poverty are morbid; still it is to be ascertained whether they have the character of melancholic delusions. The chief sign of melancholic delusions is their secondary origin from emotional disorders. Hence the patient has to be further questioned as to their origin. For this purpose the following questions are proper: *when did your guilt, sickness, poverty become evident to you? or was it since you were gloomy and anxious that your guilt, sickness, etc., i. e. the gravity of your guilt, sickness or poverty, became evident to you?* If melancholia exists it is shown that the dejection and often the anxiety had long preceded the delusions.

All of the above remarks are united in the question: *why are you dejected, why are you anxious?* It is now best to ask the further double question: *how long have you been so dejected, since when have you been so anxious?* In this way it is at once ascertained whether the case is acute or chronic.

Are you irritable also? It is best to ask this question on conclusion of testing the emotions. In pure melancholia the answer is always no; in the neurasthenic variety yes usually. Supplementary questions: *how is your interest in your occupation, as well as in your family, your love for your relatives?* may here be of importance as to the possible existence of the apathetic variety. If the latter exists the patient will complain of his pathological indifference. If the principal form of melancholia is present the patient will rather emphasize that everything is gloomy to him.

The next questions refer to the thought inhibition. In many patients the slowness of their answers saves all further questions; in others ask definitely: *is it hard for you to think?* The majority of the patients answer yes. In only a few cases, when the thought inhibition is even less pronounced, irresolute, uncertain answers may be given. The question as to occupation may be specially

* In rare cases a crime, a severe physical disease or poverty actually exists and a true melancholia at the same time. The past in such cases affords the patient at present sufficient actual material for anxious concepts; in a certain measure he does not need to look about for delusions. Twice I have seen a typical melancholia after defalcations (after serving a sentence), once in carcinoma, and once in complete sudden poverty.

formulated, *e. g.* *do you now understand what you read as quickly as formerly? or can you finish your book now as quickly as you once could?* etc. The question may be added: *what interferes with your thoughts so much?* As a rule the melancholiac knows of no cause or refers it to his dejection, *i. e.* his anxiety.

If the patient did not manifest his delusions in the question, why are you gloomy, why anxious? now ask directly: *do gloomy, anxious thoughts come to you in your dejection, in your anxiety?* It is best to be cautious in asking direct questions as to the ideas of sin, sickness, poverty, as such direct questions readily awaken these ideas in the patient. If the patient has melancholic delusions, then ask: *since when did you have such thoughts?* and ascertain, as above directed, if of secondary origin from the emotional disorder. It may surely be asked: *do you often have mistrustful thoughts?* The large majority of melancholiacs will answer no; only the rare cases included in the symptomalogical description will admit one or another delusion of persecution.

By several short questions it is now to be determined whether the patient has sense deceptions. Then ask *e. g.* whether he has heard or still hears strange "enigmatical" words from unseen voices of persons absent, whether he has seen or still sees strange forms or images, "dream fancies while awake," whether he perceives strange noises, a strange taste to his food, etc. Nine-tenths of melancholiacs will reply negatively to all these questions, one-tenth affirmatively. In this one-tenth it can easily be ascertained by a few questions that the stated hallucinations or illusions have occurred only occasionally and in the later course of the disease, at any rate after the emotional disorder. This fact is essential for the diagnosis of melancholia in the presence of sense deceptions. If it is found that the hallucinations occurred later than the emotional disorder, but still have been numerous, then the variety known as melancholia hallucinatoria exists.

The next questions should refer to the patient's intellectual condition, when it is to be ascertained whether his memory and judgment are intact. Still it will be found that he does not answer many such questions or only very slowly owing to his thought inhibition, in spite of intact intelligence. Hence I would advise questioning the relatives. Ask especially: *had the patient been forgetful before he became so dejected or anxious, did he act indis-*

creetly (ethical defects), did he err in his instructions, in his book-keeping, did he tell the same stories repeatedly, etc.? If melancholia exists all this is denied; what the relatives relate of neglect, etc., after the occurrence of the emotional disorder only proves thought inhibition and apathy, but not intellectual defect.

The last questions refer to the patient's actions. He or his relatives are to be questioned if he dresses and washes himself as usual (neglect of toilet), if he performs his duties to his family and business, if he is just as solicitous of his interests as formerly, if he eats, sleeps regularly, etc. In regard to the morbid indecision it is best to question the patient directly: *is it hard for you now to make decisions, give orders, etc.?* The answers to be expected when melancholia as well as hypochondria exists readily show the symptomatic condition.

By the preceding examination of the patient it is ascertained that the psychical type of melancholia exists, *i. e.* that the psychopathic symptoms of the case correspond to those of melancholia. This does not suffice for the diagnosis of melancholia. It now needs to be especially proven that the physical, neuropathic condition does not contradict the diagnosis of "melancholia." Melancholia exists when the psychopathic symptoms fully accord with the diagnosis of a melancholia, but not when certain neuropathic symptoms are present which indicate an organic brain disease. The following symptoms especially never occur in melancholia:

Speech disorders (hesitating enunciation, misplacement of consonants and syllables).

Paralysis of the various muscles.

Failure of the pupils to react to light.

Inequality or absence of the knee jerk or ankle clonus.

When these symptoms have been excluded by a careful examination the diagnosis of melancholia may be made.

c. *Differential diagnosis.* For the practicing physician especially, the possibility of confounding melancholia with the following psychoses* is obvious.

1. *With dementia paralytica.* In the course of dementia paralytica a stage very often occurs whose psychopathic symptoms are

* See my text-book, *Psychiatrie*, Berlin, 1894, pp. 413, 341, etc.

almost the exact counterpart of those of melancholia. This is called the depression stage of dementia paralytica. In men of middle age especially, who have previously been infected with syphilis, it is necessary to be very cautious in diagnosing melancholia in case depression exists; for the male sex, middle age and syphilitic infection specially predispose to dementia paralytica. A thorough neuropathological examination is of prime importance for a certain differential diagnosis. If one or both pupils fail to respond to light, if the knee jerk or ankle clonus is markedly weakened, or there is an inequality between the right and left knee jerk; further, if there is an evident difference in the innervation of the two sides of the face, tongue, or between the two extremities, occurring during the course of the present disease (not congenital); finally, if a speech defect (hesitation in pronouncing initial consonants, omission and transposal of individual consonants and whole syllables) is developed during the course of the disease, melancholia is thus excluded and dementia paralytica is to be assumed. Any one of these symptoms suffices to exclude melancholia and turn the diagnosis to dementia paralytica. On the other hand, the absence of all these symptoms by no means excludes dementia paralytica with certainty, for there are cases of this disease in which the physical symptoms are absent for a long time and only the psychopathic symptoms are evident. Hence the condition of the intellect must be taken into account. In melancholia there is only thought inhibition, the intellect is intact; in dementia paralytica an intellectual defect always exists, which is early shown in the deterioration of the ethical ideas in the broadest sense, and is manifested in indiscretion, lack of judgment, immorality, etc. In doubtful cases always question the relatives, as above advised, whether forgetfulness, indiscretions, etc., had occurred prior to the emotional disorder. I remember a merchant whom I first examined during great depression. A direct test of the intellect was impossible, for in his pathological anxiety he could not be induced to answer questions. Syphilis was not determinable. A very careful physical examination failed to reveal any suspicious symptoms. His wife stated positively that before the development of the present depression he had told her the same stories two or three times in one day, while he had conducted his business affairs and other

matters with perfect correctness. The further course confirmed that it was a case of dementia paralytica; in a few months the typical physical symptoms occurred, the intellectual defect became very apparent. Likewise immorality, indiscretion, etc., are suspicious, in that they are not compatible with the melancholiac's apathy. The paretic in the incipient stage of his disease positively transgresses customs, laws, morals, etc., but not from neglect like the melancholiac. Also in regard to neglect the condition is entirely different. Neglect of toilet *e. g.* appears in both, in the paretic and in the melancholiac. But how differently the two behave when censured for their remissness! Owing to his intellectual defect the paretic has usually lost entirely all comprehension of his fault, while the melancholiac is fully conscious of it and laments that he has become so indifferent.¹

The contents of the delusions are often indicative. The paretic delusions of anxiety betray by their silly extravagance and lack of connection, by their contradiction and scanty motives, the dementia being developed. The melancholiac's delusions of anxiety are occasionally extravagant. The melancholiac often claims he has made the whole world miserable, eternally robbed it of its happiness, etc., but he cannot readily be brought to the claims of the paretic; he has stifled the whole world in his filth. In respect to censures the melancholiac tries shrewdly to defend his delusions or he appeals very pertinently to his anxiety; the paretic usually is capable of only an apparent defense. Hypochondriacal delusions of physical diminution—"I am only a finger tall"—closure of the natural orifices of the body—"my mouth, my anus has grown up, feces have collected in my intestines for years"—and the disappearance of whole organs—"my lungs are gone, my tongue is lost," etc., are especially indicative of dementia paralytica. However, a decisive importance is not to be ascribed to the contents of the delusions, for occasionally they also occur in hypochondriacal melancholia.

One must avoid confounding the thought inhibition of melancholia with intellectual defect. If a patient in a state of depression does not answer at all or very slowly the simplest questions as to the multiplication table, as to the name and age of his

¹ See Hoche, *Die Frühdiagnosen der progressive Paralysis*.

children, intellectual defect does not need to exist, for the whole condition may be due to intense thought inhibition. The failure to answer must be used with the greatest caution in favor of the diagnosis of dementia paralytica; only the mental enfeeblement shown in the answers given is directly and certainly of value. Hence it is best, as already advised, instead of testing the patient's apparent intellectual condition, to ascertain from his relatives whether a defect existed prior to the present depression.

The differential diagnosis between melancholia and dementia paralytica thus depends first on the physical condition, and second on the proof of an intellectual defect. If all the precautions mentioned are observed a certain decision is almost always to be arrived at.

2. With *simple chronic paranoia*. When delusions of persecution (see above) occur in melancholia they are often very similar to those of paranoia. The differential diagnosis is easy by asking the patient directly if he deserves the presumed persecutions. The melancholiac replies: yes, I have sinned grievously, etc., I deserve punishment; the paranoiac indignantly asserts his innocence.

3. With *acute hallucinatory paranoia*. In a patient with intense anxiety, be it anxious agitation, be it a stuporous condition, the question arises especially whether the anxiety is not due to hallucinations and so not melancholiac, but an acute hallucinatory paranoia. We know that terrifying sense deceptions often occur in the latter and prodromal stages of anxiety which outwardly are exactly like those of melancholia. The real distinction, alike for prognosis and treatment, is that in the first case—in hallucinatory paranoia—the anxiety arises from the hallucinations, while in melancholia it is wholly independent, primary. How can this be ascertained in the examination of the patient? Owing to the patient's agitation or stupor little is to be gotten from him. His facial expression teaches more. In both patients the anxiety is depicted, but in paranoia a listening or visionary expression is added. The eyes are either fixed on vacuity, the patient inclines his head to one side as though listening or he suddenly turns to the right or left. Besides in acute hallucinatory paranoia other hallucinations now and then occur in those cases in which the terrifying variety prevails. Hence it is observed that the attacks of anxiety are frequently interrupted by states of exaltation or

outbreaks of anger. Finally the anamnesis affords an excellent aid in differential diagnosis, by asking the relatives how the disease developed. If it is a case of melancholia it is learned that first a motiveless dejection occurred; if it is a case of acute hallucinatory paranoia the disease begins acutely with sense deceptions or preceded by a brief stage of distrust. Also ask the patient: are you anxious because you hear threatening voices, see horrible forms, etc., which will often be decisive.

4. With *neurasthenia*. When the transition forms are excluded the differentiation is not difficult. The neurasthenic's emotional disorder consists principally of a pathological irritability; the melancholiac's of a pathological dejection. The simple question, is the tone of feeling chiefly irritable or depressed? usually suffices for the differentiation between neurasthenia and melancholia. The majority of patients give a perfectly clear and definite answer. Still it must be remembered that temporary dejection and temporary anxiety also occur in neurasthenia.

5. With *senile dementia*. In old age—that of 60—one should be cautious of diagnosing melancholia. Senile dementia very often presents a stage of depression with intense anxiety which is very similar to that of melancholia. The differentiation usually depends on the anamnesis; it must be ascertained whether forgetfulness, weakness of judgment, ethical defects have been observed previous to the stage of depression and anxiety. Absence of such premonitory symptoms permits the diagnosis of melancholia.

8. TREATMENT.

The physician's duty in the treatment of melancholia is threefold. It embraces:

a. *The decision whether the melancholiac shall be treated at home or in a hospital, and in what one.*

b. *The treatment of the patient—in severe cases—until the commitment to an institution; in most parts of Germany one to two weeks elapse, in which an improper treatment causes many incurables, while proper treatment may be of great assistance to that of the hospital.*

c. *The continued treatment of many cases of so-called melancholic depression or hypomelancholia.*

In the following pages these three conditions will each be discussed in detail.

a. Decision as to the Place of Treatment.

It is to be considered a universal rule that admissions to a hospital must ensue in all cases of melancholia which manifest real anxiety. Suicide is always the greatest danger in melancholia. It is always the gravest when anxiety accompanies the dejection. Hypomelancholia in which anxiety is absent very rarely causes suicidal attempts; simple dejection without anxiety is insufficient to lead the patient to suicide; his abulia interferes with the determination. It is different in melancholia gravis with anxiety. Here suicidal attempts are very frequent. In a third of all the cases at least it is to be expected that the patient will attempt suicide at a favorable moment. Hence the general rule: in real anxiety, commitment to a hospital where there is a possibility of care and intelligent supervision, and so the prevention of suicide is secured. Alas! this rule is very frequently transgressed. Consequently the numerous suicides effected by melancholiacs whom the physician has neglected or hesitated to send to a hospital in spite of the presence of anxiety. Exact statistics are wanting, but an approximate conclusion is permitted by the fact, that of the 238 melancholiacs who were received at the psychiatric clinic from 1886-1894, 38 were owing to suicidal attempts fortunately thwarted by mere accident. In the majority of these 38 cases it can be proven that the attending physician had unwarrantably postponed sending them to the hospital. Owing to our physicians' lack of knowledge of psychiatry the suicidal attempt is usually the first intimation of the presence of a melancholia and its significance.

Besides, the physician is usually able to fully inform himself as to the danger of suicide by a direct simple question. Ask the patient, "Do you feel tired of living?" The majority of melancholiacs do not dissemble, and in replying to this question, which possibly is to be often repeated, state their suicidal thoughts. A false reserve often prevents the physician from asking this question. He believes he will thus excite such thoughts or perhaps vex the patient. I have never observed any harm from this question; on the contrary, it has more often been a relief to the

patients to communicate to the physician the suicidal thoughts tormenting them, and affords the physician a certain foundation for therapeutic measures.

From the rule that anxiety should cause the physician to send the melancholiac to the hospital as quickly as possible, I know of only one exception: when the surroundings—residence, property, etc.—are so favorable that the patient can be given as careful supervision at home as in a hospital, and the physician likewise possesses the requisite experience in the treatment of melancholia, the home treatment of melancholia may then be attempted. The requisite possibility of careful supervision refers to two things especially: first, for the accommodation of the patient a room on the ground floor must be at his disposal; and, second, a trained attendant must be had for constant supervision.

This exceptional case shows that the rule is very general; anxiety—commitment to a hospital. The choice of the hospital is not difficult. In the majority of cases the public insane hospital is all there is. Ordinary hospitals are wholly unfit. I have known many cases where suicidal attempts were made and often successfully in them. If it is a well-to-do patient a private insane hospital naturally should be chosen. Many so-called private sanitariums are adapted to milder cases in which the anxiety does not cause loud lamentations and ravings, also for many cases of melancholia passiva, especially when the patient's means are sufficient to pay for admission to such an institution as well as for a very essential private attendant.

The commitment is to be hurried as much as possible. The patients may be sent to some institutions at once without the prior consent of the authorities, merely on the physician's statement. In others the consent of the authorities must first be obtained. It is not only the physician's duty to hasten this matter as much as possible, but also to do his part toward removing these obstructive stipulations endangering the patient.

b. Treatment of Melancholia Gravis until Admission to the Hospital.

The chief purpose of this treatment, when melancholia exists, is, first, the prevention of suicide, and, second, the provisional introduction of a proper treatment of the disease.

For the fulfillment of the first obligation—prevention of suicide

—the following orders are essential, which are to be given immediately after the diagnosis of melancholia has been made. First of all the patient is to be put in a room on the ground floor, if possible. Suicide by jumping from the windows is to be especially feared. If a room on the ground floor cannot be given the patient, at least fasten the windows so that the patient cannot open them. For ventilation it is to be arranged so that only the upper sash can be opened, and this only when the attendant sits close beside the patient. Also the provision of screens to prevent a jump from the window is to be considered; the screens must be locked so that the patient cannot open them.

The door of the patient's room likewise needs a lock. It has often happened that a patient, in spite of the attendant's constant presence, has suddenly run out of the room and either jumped from a window of an adjoining room, has thrown himself down the stairs, or has run to the nearest pond or tree to drown or hang himself. In such cases the attendant is often too late. When such fears are justified the attendant should fasten the door on the inside and so that the patient cannot unlock it, but so that it still may be opened from without. This is necessary because the attendant occasionally needs help quickly with a very excited melancholiac and is unable to open the door for persons coming to his assistance in a struggle with the patient.

Under all circumstances the patients are to be kept in bed constantly. This makes their care easier and is also advantageous in the treatment of the disease (see below). The patient's abode is not to be left until he is in bed. The physical examination offers a good reason for putting him in bed. The clothing had better be entirely removed from the room. Be especially sure that the patient has not taken a knife, scissors, a piece of glass or a cord to bed with him. I have more than once found in the melancholiac's pocket or bed a cord, scissors or knife. In one case I found a pair of scissors in the patient's vagina! It is well to make the bed twice a day, under the pretext of airing and straightening it.

A constant supervision of the patient is to be arranged for. If the patient is left alone, in spite of the above precautions—a room on the ground floor, locking the windows, placing in bed, removal of dangerous instruments—a suicide will undoubtedly

occur; the patient will tear a strip from the sheets and hang himself to the door or bedpost, or break out a pane of glass and with a piece of it sever the radial artery, of all of which occurrences every alienist can cite examples. Therefore it is indispensable that a trusty person be with the patient constantly. The patient is not to be left alone for a moment. If the attendant must go away he must wait until relieved by an equally trusted person. A trained attendant is naturally the best, yet such is not usually to be procured. Then choose a trusty person from the patient's neighborhood, and by repeated, detailed instruction, and more often by your own example, seek to overcome his lack of experience. It cannot be too often emphasized that the attendant is not to be deceived by the patient's apparent tranquillity. It is evident that the attendant must be more often relieved when on duty for a longer time, especially when the commitment to the hospital is delayed. It is then best to arrange for a regular change. When possible fix it so that the attendant can get help quickly, as I have already stated. Have some one occupy the adjoining room. A whistle as a signal for help is very good.

Special precautions are further demanded in regard to the patient in eating, going to the closet and during the night. As to eating, order that no knife or fork is to come into the room. Meat, etc., is to be brought into the room cut up and eaten by the patient with a spoon. Do not state the real reason to the patient, for it can be made to appear that his digestive derangements render a finer chopping of the meat advisable. If the attendant eats in the patient's room he must also limit himself to a spoon. Disregard of these apparently pedantic precautions has often led to suicide. Only when every sharp instrument is banished from the melancholiac's room is there security. The patient's bowels are to move in his room (bed-pan, vessel, etc.). The necessity of ventilation has already been mentioned. It is best to keep awake at night. It is well for the attendant to fasten the keys of the door and windows about his bare body; otherwise it is to be feared that if he involuntarily goes to sleep, the patient may get the keys and commit suicide. At night a regular relief of the attendant is especially necessary.

The fulfillment of the second factor—*beginning of the proper*

treatment to be continued in the hospital—is almost as important. The recovery of melancholiacs is essentially retarded when their treatment prior to admission was improper or wholly neglected. Three general rules are to be considered especially in the preliminary treatment:

1. Rest in bed.
2. Opium.
3. Wet packs.

The importance of rest in bed as regards supervision has already been mentioned. Therapeutically it is of greater significance. The patient is thus immediately removed from the changing impressions of daily life, to which may be combined emotions and concepts of anxiety. Innervations are spared the exhausted nervous system, the disordered circulation (see above) is afforded the most favorable condition for its regulation.

Opium treatment is demanded in every case. It directly counteracts the suicidal tendency by lessening the anxiety, but above all by its early employment and methodical administration it assures an essentially shorter and milder course of the disease. In regard to this and other particulars I refer to my *Psychiatrie* (Berlin, Fr. Wreden, 1894), and here present only the following facts: Give 0.05 of pulverized opium in powder or pill four times a day. The simple tinct. opii may be employed (10 drops four times a day). In extremely debilitated as well as in very young or old individuals, and finally in those with heart troubles, the dose naturally must be somewhat smaller. The best hours for giving opium are 7 A. M., 3 P. M., and 8 and 10 in the evening. The dose is to be increased 0.05 daily. It is best to give the larger dose in the evening so as to procure more rest during the night. When the "morning anxiety" (see above) is very intense give a larger dose in the morning (about 5 o'clock). In this way on the 5th day 0.1 of opium may be given four times daily. It is then to be further increased in the same way. If toxic symptoms appear (severe myosis, marked somnolency), continue the same dose for one or two days. Possibly a night dose may be given later. If the patient is somewhat quieter for one day it is no reason to discontinue the increasing doses; they should rather be increased and so in a certain measure prevent the impending anxiety. The commitment to a hospital should never be delayed or wholly

given up by a temporarily very marked effect of the opium treatment, for very soon intense anxiety will recur.

The subcutaneous employment of opium (ext. op. aq. 1.0, aq. dest. 15.0, glycerine 5.0) is less suitable; it often agitates undeveloped melancholiacs prejudicially. Subcutaneous therapy is limited to—

1. Cases in which there are severe gastric and intestinal disorders.

2. Cases in which there are very severe attacks of anxiety when it is essential to quiet the patient very quickly.

3. Cases in which the patient refuses to take medicine.

Morphine does not seem to me nearly so suitable as ext. op. aq. As to dosage, the effect on the psyche shows that 5 cgrm. of opium pulv. per os or 4 cgrm. ext. op. and 1 cgr. of morphine subcutaneously are about equal.

The highest dose to be given outside of a hospital is 0.2 or 0.25, the highest daily dose 0.8 to 1.0. By admission to the hospital the physician is usually spared such high doses.

The hydropathic treatment materially supports the effect of the rest in bed and the opium. Outside of the hospital wet packs are the most advisable. The arms may be left out of the pack; a temperature of 24° R. should be given for one hour. It is best given in the evening. Prolonged baths (26°-28° R. for one hour) often have a favorable effect, but are not to be employed often and are especially hazardous, for the patient has to leave his room and so readily finds an opportunity to commit suicide.

Besides these general indications furnished by the disease there are still numerous special indications, which arise from individual symptoms, to be taken account of. The most important are the following:

The physician is often embarrassed by the excited frenzy of melancholia agitata. Opium per os is here contraindicated. Also subcutaneous injections of aq. ext. of opium and morphine, which are usually tried, are often ineffectual. A subcutaneous injection of morphine 0.015 with hyoscin 0.0005 (hydrochlorate or hydriodate) is the surest. In weak patients the dose should be somewhat smaller, in strong patients larger. As a rule several hours sleep follows. In case of marked agitation such a mixed injection is very suitable on transfer of the patient to the hospital.

The patient's nutrition presents special difficulties. Cocoa, milk (with lime water 1 teaspoonful pro $\frac{1}{2}$ lit.), eggs, meat, butter are especially suited to the diet of melancholiacs. Sweets and puddings are badly borne. Green vegetables (cabbage, lettuce, green beans, etc.) and berries are always to be forbidden. One or two glasses of beer are permitted. Wine is often very beneficial, especially in the senile forms. It is best generally not to give too much at one meal, but to offer food frequently. As opium lessens the stomach's secretion of hydrochloric acid (also in subcutaneous administration), so from the first one teaspoonful of hydrochloric acid solution (3:200) is to be administered after each meal of albuminoids. Contingent nausea is to be met with cracked ice or small doses of atropia (0.0005). The ordinary stomachics are almost always contraindicated in melancholia gravis. The greatest weight is to be laid on the scrupulously exact care of the mouth. The tongue, teeth, etc., must be cleaned with a moistened rag by the attendant before and after each meal. The patient's mouth is to be washed out every four hours. In refusal of food do not resort to the stomach tube. It is generally possible to overcome the patient's resistance by patient and energetic persuasion. Immediately after a pack the patient may often be induced to take food. Above all the patient is to be repeatedly offered something, and existing digestive disorders (see below) removed, which often contribute as much toward the refusal of food as the anxiety and delusions. If the abstinence continues, administer nutritive clysters ($\frac{1}{2}$ lit. water, 2 eggs, 2 teaspoonfuls of starch, 0.05 of opium, a pinch of salt, 31° R.). With weak individuals begin such clysters after 18 hours of total abstinence, in strong persons 24 hours may lapse. Feeding with the tube is in general not to be thought of before 5 days of total abstinence. Naturally the state of the patient's strength is to be considered when deciding as to the time.

Smoking is always to be forbidden.

The patient's constipation may cause great difficulty. It is due to the melancholia. The opium treatment, which is often said to be the cause, only temporarily disturbs the intestinal peristalsis; on the contrary, it is often observed under opium treatment that the constipation yields with the cessation of the anxiety. If 36 hours lapse with no or insufficient bowel movement, a clyster of

glycerine or an enema is to be given. Castor oil (two teaspoonfuls in the morning fasting) is proper. Only in the most obstinate cases should high injections be given. The diarrhoea occasionally interfering with the opium treatment can be met with tinct. coto or nitrate of silver. Cotoin (0.1 to 0.15 several times daily) acts well in such cases.

Sleep is often very poor, yet a frequent use of hypnotics is not proper. At the most, occasionally give, besides the evening dose of opium, trional 1 grm., chloralamid 2 to 3 grms., or valeric aldehyde 4 grms.

A methodical psychical treatment during the short time of the preliminary treatment can hardly be thought of. Yet above all avoid discussing the delusions. Limit yourself to a brief word of consolation and an occasional authoritative protest to the delusions. As well to the assertions of the melancholiac that he is not sick, but bad, as to the extravagant ideas of illness of other melancholiacs, refer to the condition of the first thorough examination. Say to the first, according to the findings his nervous system is sick; after he is over this disease his sins will be then discussed. To the latter say that the examination has revealed this or that harmless symptom, besides the mental trouble; owing to the mental trouble he very materially exaggerates it, but both will be relieved, the mental disorder and the symptom worrying the patient. Then to quiet the patient treat the symptom to which his anxiety is due, *e. g.* the herpes praeputialis, from which arises the fear of syphilis; still it must not be thought that with the relief of these symptoms the hypochondriacal anxiety will disappear. The treatment of the melancholia is always the principal matter. Occupation may be permitted the patient in bed, yet only in so far as it is possible without sharp instruments.

The physician's visits should be daily if possible. On each visit inquire as to the—

1. Temperature, respiration and frequency of the pulse; the respiration especially is often an excellent index as to the emotional disorder (see symptomatology).
2. State of contraction of the peripheral arteries; the more tensely the arteries are contracted the more intense usually is the emotional disturbance.
3. Condition of the tongue; remind the attendant of the mouth's care.

4. Movement of the bowels; give the necessary orders immediately.

5. Taking of food; have an exact statement of what the patient has eaten in the last 24 hours. In many cases it is practicable and advantageous to keep a book. If the food has been insufficient, at once make an effort to get the patient to eat something (milk, bouillon with egg), and exemplify to the attendant the patience necessary.

6. Sleep.

7. Pupils with respect to the effect of the opium.

8. Psychological condition; ask the patient about his dejection and anxiety, whether and when they have been especially intense. To ask him about his delusions at every visit is pernicious. From the greater or less slowness of the answer a conclusion may be drawn as to the degree of thought inhibition. For testing the thought inhibition several indifferent questions may be asked.

On the basis of these facts now give orders for the next 24 hours (doses of opium, possible hypnotics, packs, etc.). Never leave the patient's abode without having repeatedly emphasized the precautions against suicide.

When the transfer to the hospital is granted do not hesitate a day. Give an agitated patient immediately before starting, as above stated, a mixed injection of morphine and hyoscin. A stronger dose of trional (1.5 grms.) in water four hours before the transfer, is permissible in such cases. Plainly tell quieter patients that they are now to be taken to the hospital* and provide sufficient attendance for the journey (two attendants at least if on the cars). It is entirely wrong to deceive patients and make them believe they are to "visit some one," "some one expects them," etc. The patients who later perceive the deception are thus often inspired with a mistrust hard to overcome, which quite often seriously interferes with the benefits of the hospital treatment. All falsehoods by which momentary excitement may be spared the patient and those about are avenged by a long mistrust on the patient's part, and hence are to be avoided. Finally, I would advise, in the interest of the further hospital treatment, giving the hospital physician a detailed history of the disease, including all

* See Emminghaus, *Behandlung des Irreseins im Allg. Handb. d. Spez. Therapie*, Bd. V.

points coming under this heading, especially the size of the last day's dose of opium.

c. *The Continued Treatment of Hypomelancholia.*

The physician should only consent to this when he is experienced in the treatment of psychoses, and the home conditions are favorable, so that the following plan of treatment is practicable and no disturbing conditions are to be feared. If one of these two conditions is not to be fulfilled it is better to send the patient to an insane hospital or sanitarium. The majority of insane hospitals now have open wards for mild cases, so the aversion, which exists somewhat still, is wholly unjustified. In many cases the transfer of the patient to the family of a relative or a stranger is to be recommended, change of residence often acting very favorably. It is naturally to be presumed that in the other place the two conditions mentioned are possible.

Regulation of the habits of life is one of the first therapeutic measures. In any case all employment is to be forbidden the patient, because the inability due to his thought inhibition and abulia tends to increase his depression. For the same reason housewives are to be forbidden housework or anything requiring a decision. To spare the patients the hourly torment of deciding to do this or that, it is to be arranged by time. The details naturally depend on the patient's sex, position, education, etc. In any case short, slow regular walks are to be taken. Rest in bed is to occupy a part of the day, but not at the will of the patient. Very essential is occupation which engages and diverts the patient without wearying and depressing him. Drawing, painting in water colors, making abstracts, simple copying, easy translations, botanizing, garden work, fret-sawing, modeling, etc., are especially applicable. With female patients certain hours are to be set apart for light handwork, cooking, etc. Simple games are often advantageous.* The usual attempts at forced amusement (concerts, theater, society, etc.) are to be entirely discon-

* Willis (*De anima brutorum. Pars pathologica*, p. 159; *Opp. omn. Amstelodami*, 1862) gives similar directions. He orders amusement, e. g. by "pictura," but then he continues: "quos deliciae aut ludicra non juvant (quibusdam enim melancholicis ea semper ingrata) illi ad negotia leviora uneunda suscitentur—etiam peregrinatio interdum valde prodest."

tinued. Regular but not fatiguing gymnastics (calisthenics, dumb-bells and staff exercises) are very proper. I have very often used the following plan with educated patients: Until 9 A. M., in bed; 8 A. M., first breakfast in bed; 9 A. M., cool bath of the whole body and dressing; 9½-10 A. M., rest and second breakfast; 10-11 A. M., drawing; 11-12 A. M., light cooking, dusting, etc.; 12 M.-12¾ P. M., a walk; 1 P. M., lunch; 1½-3½ P. M., in bed; 3½ P. M., bath as in the morning, dressing, glass of milk; 4-4¾ P. M., a walk; 4¾-5½ P. M., rest; 5½-6½ P. M., making an abstract, *e. g.* of a description of a journey; 6½-7 P. M., rest; 7 P. M., evening repast, 20 exercises with the dumb-bells previously, then to bed; 8-9 P. M., light handwork; 9 P. M., lukewarm bath of whole body (23°-26° R.).

The physician's tact chiefly consists in adapting this plan exactly to the individual case as far as possible. It must be daily ascertained if the patient adheres to it and be made to show what has been done.

The diet is to be regulated similarly as in the preliminary treatment of melancholia gravis. Careful care of the mouth is essential. Hydrochloric acid is to be ordered when necessary. Of the stomachics tinct. nux vomica is the best. The constipation is to be treated by abdominal massage and methodical gymnastics; compot is also to be given in the morning fasting. If the nutrition is very poor a regular diet is to be considered. Iron, arsenic and cinchonia are often proper as adjuvants.

The sleep occasionally requires assistance. A glass of heavy beer often suffices. Gentle massage of the neck and forehead is occasionally useful. Real hypnotics are to be completely avoided if possible. At the most, chloralamid (2 grms.) or trional (1 grm. in hot milk) may be administered once a week.

On the whole medicines are not indicated. A regular opium treatment especially is not indicated. If the patient complains of mild, indefinite anxiety, give 0.05 opium or 0.03 codein phosphate occasionally. If intense anxiety occurs, all that has been said as to the treatment of melancholia gravis is applicable; transfer to a hospital is not to be neglected, and even scrupulous supervision against suicide is demanded. If anxiety does not exist it is well to ascertain by an occasional direct question (see above) whether there are suicidal thoughts.

Mild hydrotherapy is very useful. Repeated cool baths during the day often act very favorably. In the evening a warm sponging is preferable (see above plan). Instead of this a wet pack 23° R. for $\frac{3}{4}$ of an hour, in anemics 26° - 29° R., may be given; the arms are to be left free. Mild faradic baths (24° R., 20-25 min.) I have recently found very efficacious.

In the latter course of the treatment, often very tedious, when the physical condition is improved, the patients are gradually to be accustomed to more physical and later to more mental occupation. If a long stationary period in the improvement occurs and the disease threatens to assume a chronic character, a change of abode is imperative, as *e. g.* removal to a stranger's family, to a sanitarium, or a journey with a trusty relative or friend.

Melancholia is one of the most hopeful of mental disorders. Under proper treatment the percentage of recoveries amounts to over 90 per cent. The percentage of actual recoveries is much lower, owing to many cases being kept out of a hospital or from termination in suicide. May these lines succeed in lessening the number of these incurable yet once curable cases.

ON CHANGES IN THE NERVE CELLS OF THE CORTEX IN A CASE OF ACUTE DELIRIUM AND A CASE OF DELIRIUM TREMENS.

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One of the cases which I wish to present in this paper I have reported to the Medico-Psychological Society of Boston in March, 1897. Since that time I have studied the specimens from a case of delirium tremens which I wish to present here also.

Since reports of alterations in the nerve cells in the so-called functional psychoses as well as in delirium tremens have been very scarce thus far, the study of the following two cases may be of some interest. This is the reason why I publish them, in spite of the fact that the work is in a number of ways imperfect; none can appreciate this better than the writer.

Case I, I have called a case of delirium acutum. This term needs an explanation, as it is very apt to be misunderstood. "Delirium acutum" is not a diagnosis like general paralysis, "Verblödungsprocess," or circular insanity, but is rather like the term depression, or excitement, or stupor. From these latter terms delirium acutum only differs inasmuch as in these a symptom complex is described with reference to its symptomatic character, in delirium acutum it is chiefly the intensity which is decisive. This is the sense in which I wish the term to be understood; it is a term which presumes nothing, and as I stated is above all not a diagnosis.

The diagnosis in the case is somewhat doubtful—a circumstance which detracts considerably from the value of the communication. The clinical history, however, is given in full in order to allow others to make a diagnosis for themselves.

Case II is an instance of delirium tremens, the specimens of which were kindly sent me from the Rhode Island Hospital. In

both cases no lesions were found in the other organs. This fact is of importance, for it has been my experience that somatic diseases of various kinds are very apt to produce cell changes, that therefore a complete autopsy is necessary for an interpretation of the cell changes found in a given case. But even with a complete autopsy which demonstrated the absence of any other disease, we cannot be certain that the cell alterations are due to the disease process which gave rise to the psychosis, as we shall see. The difficulties in the interpretation of such changes are therefore many, and the advance we have thus far made very slight.

CASE 1. The patient was a young man, 19 years of age. In his family some neurotic traits are found. In 1892 he had an attack of excitement, which was observed by Dr. Folsom of Boston, who kindly gave me the data which are summed up in the following lines: The disease is said to have been preceded by the grippe; he had headaches and fever, and after he had recovered from this he began to have hallucinations of hearing. He soon got into a condition of great excitement, walking about a good deal, talking much in a rambling manner. His behavior was silly at times. A prominent feature were the hallucinations all through the attack, as well as his numerous delusions; the latter were often of an exalted character, for example he thought he was Napoleon. But they changed frequently. He quieted down after about four to five months. But some time after this on one occasion he again became excited and irritated from external causes, and again it became apparent that he had hallucinations. During the entire attack he slept well. Within about a month after quieting down he made a complete recovery.

The patient is described as being always rather peculiar; as a relative expresses it, "His mind was developed in a peculiar manner, some parts much more than others." He was, however, very intelligent, and, for example, wrote very good imaginative stories. Physically he was well built.

Before his present attack he had been working for the Harvard examinations and was compelled to give it up because his confidence failed him. He was depressed over that, but not unnaturally so at first. This depression deepened and became distinctly pathological about ten days before the onset of the more active symptoms.

Two nights before admission he showed some signs of suspiciousness; as he heard the rain on the roof he asked whether some one was there; he could, however, be reassured, and the following day he was fairly quiet, but during the night became suspicious, frightened, excited. He was brought to the McLean Hospital on the evening of July 28th, 1896.

On admission the patient appeared exhilarated, whistling and dancing

around the room somewhat. He talked but little spontaneously, and when seen later he appeared a little dazed. At supper he gulped down his milk, took large bites of his food, swallowing them without chewing them much. He had quieted down previously, and for the rest of the evening sat or lay down quietly, although "appearing on the verge of excitement" and looking somewhat frightened. During the night he did not sleep, but at first was restless, tossing about, after midnight getting out of bed and walking around the room, or standing in one place looking around in a frightened manner. He suddenly rushed into another patient's room, and when he had to be taken away was very much excited and struggled; he quieted down again when held. Temp. 100.5°, pulse 120.

July 29. At breakfast he suddenly screamed out without provocation, spat out his food, threw the spoon at the nurse and tried to overturn the table; he struck and kicked at the attendants, and when held became so violent that it took four men to restrain him. In his excitement he cried out "What is happening?" "What have I been doing?" etc. Often he called for help, shouting the names of some friends. His excitement was so intense that a camisole had to be applied. When seen in the morning he was lying in bed looking frightened, face flushed, his pupils wide, pulse about 120; when asked questions he looked suspiciously at the physician and those about him, but would not answer. Suddenly he asked in a frightened tone, "Am I going to be thrown overboard?" And when it was explained to him where he was and that he was not on a ship, he only said "Yes I am." He is a strong-looking, well-built young man; his weight (taken the evening before) is 180; he is about 5 feet 9 inches in height.

With his excitement there is no evidence of maniacal incoherence, nor do his attacks of excitement appear to be due to an elementary motor excitement, but there is something impulsive about them. He had asked for water, but when given it he would not drink and said in a frightened voice that it was poisoned. He asked to have the camisole taken off and it was removed. As it was a very hot day he was given frequent sponge baths. His pulse 120, temperature 99.5°. During the remainder of the day the patient had repeated outbursts of excitement and violence, similar to those in the night.

Urine high-colored, acid reaction, spec. grav. 1030. There is a large trace of albumen; epithel. cells both small, round and columnar; numerous hyaline casts with small cells attached and a few leucocytes.

July 30th. He has not slept any at all. He has shouted and struggled a good deal during the night. In the forenoon the patient was quiet, the restraint was removed and he was bathed; while in the bath he put his head under the water and opened his mouth. He did not resist when taken out of the bath, and remained silent when put to bed. Later he asked his attendant to leave the room and said he would put them all out; he began to struggle again violently, but without shouting. Suddenly he made a dash towards the brick fire-place with his head down, apparently

with the blind intention of doing himself some injury, and on one occasion he said, "You had better let me tear my own eye out." Later in the day he again made a similar attempt to run his head against the fireplace, and tried to bite a piece out of the tumbler. He occasionally uttered sentences like "I want to lead a clean life," or "If they only would let me lie on those bricks it would be good for the suffering humanity." Once he said his sister was upstairs and needed him and he ought to be allowed to go to her. He had to be kept in restraint most of the day. His temperature could not be taken because he resisted too much. Pulse 130. He has seemed nauseated and has vomited his dinner. He eats very reluctantly, and has to be coaxed constantly and fed.

July 31st. He slept only about twenty minutes all night, and struggled and resisted much during the night. This morning he is quieter than before and his pupils are less dilated. He appears dazed, rarely answers questions, and then not rationally. He eats reluctantly and said to his attendant, "You eat, I shall be damned and you saved." He was quiet during the day, lying on his bed a large part of the day; he repeated "19" at short intervals for over an hour.

August 1st. He has frequently wet himself. To-day, when frightened at a slight noise in the next room, he called out in abrupt sentences, "O God," and "I give in my Maker's name." He probably has hallucinations of hearing, as he spoke of voices.

August 2nd. Since yesterday the patient's color looks bad, he is rather dusky, his pulse is constantly high, he sleeps none at all. He answers no questions, often lies in bed heavy-eyed and dull, then he suddenly starts up and shouts, "We must go out, we must, we must," or "Come here ye men of Galilee." Alcohol and strychnia $\frac{1}{16}$ were given t. i. d. He often mutters and talks unintelligibly; often lies with his eyes fixed on one place on the ceiling, and keeps constantly moving his legs about; still struggles considerably at times when anything is done to him.

August 3rd. Patient looks badly—his color is dusky, his pulse constantly high, now 132, not strong, his temperature 101.8°. He looks not unlike a sick delirious fever patient. His abdomen is apparently not sensitive. It is impossible to examine his heart and lungs because he struggles. He is now constantly moving his legs and arms, frequently turning and twisting, sometimes suddenly jumping up. When held he becomes resistive, apparently blindly frightened, and calls out for help.

August 4th. He slept none during the night; again struggled a great deal, but in the morning became unconscious; again he rallied and struggled. He looked cyanotic, pulse very high, rising to over 140, and easily compressible; he was completely unconscious for several hours before death. Died at 10.30 A. M. During the whole course of his illness he obtained a very fair amount of food, partly by mouth, partly by nutrient enemata.

The diagnosis of this case presents certain difficulties. When once the disease process becomes very intense, as it apparently

was in this case, the characteristic features are apt to be covered up to some extent. The differential diagnosis lies between what Kraepelin calls a "Verblödungsprozess," especially katatonia, circular insanity, and general paralysis.¹ General paralysis is included in the differential diagnosis chiefly because we know that this disease can assume the form of a delirium acutum. Nothing positive speaks for this diagnosis, however, while a number of points may be brought up against it. The age, the absence of syphilis, the very complete remission which we would have to assume, as well as the character of the anatomical changes in the cortex, the absence of vascular changes, the absence of any evidence of chronic changes, all these points speak against general paralysis. The differential diagnosis, then, lies between circular insanity and katatonia. We know that in both these diseases we may have repeated attacks, in circular insanity with intermissions in which the patient is perfectly well; in katatonia, with remissions more properly so-called, in which frequently the patient has lost his ambition and his interest, or in which he retains certain mannerisms or a certain abnormal reticence, if the first attack does not produce a deeper dementia; on the other hand, we meet frequently enough with cases of unquestionable katatonia in which the remission is absolutely complete; we have seen a number of cases of this kind in this hospital. The apparently maniacal character of the former attack and the depressive of this would at first strongly suggest the diagnosis of circular insanity; and although it must be acknowledged that in this attack there is little that speaks in favor of this diagnosis, it might be assumed that its intensity masked the characteristic features to that extent. In the former attack the many hallucinations, which evidently were a prominent feature as well as the very numerous delusions, would make one somewhat hesitate as to the diagnosis. Nevertheless, the brief general description which we have of the first attack is not incompatible with the diagnosis of a maniacal phase of circular insanity. Dr. Folsom stated that to him it looked not unlike a case of hebephrenia. However this

¹ With reference to these diseases, and in general to clinical psychiatry, I must state here that I adhere to Kraepelin's school, and that the two terms katatonia and circular insanity are used in the sense of Kraepelin's teachings.

may be, the fact is that we have an attack of excitement which retrospectively judged may have belonged to either katatonia or circular insanity. The second attack, however, while having little that suggests a circular insanity, presents many features that speak for katatonia.

First, something ought to be said about the course and intensity of the disorder. It does not seem to lie in the disease process of circular insanity to produce attacks which in themselves lead to death, while this may occur in katatonia. This is a point which I have never considered formally, but which experience, especially that during my stay in the summer of 1897 in the Heidelberg clinic, has brought home to me.

If we sum up the mental picture we find that the patient was in a somewhat stuporous condition, in which he answered rarely any questions, or answered irrationally, but he paid attention, looking about suspiciously and showing by a few answers that he understood what was said to him; when something was done to him he resisted, and often got into a violent struggle, or without external cause became intensely excited, without, however, showing the least evidence of maniacal traits in his excitement. There seemed to be suspiciousness and fear, perhaps some hallucinations, apparently vague confused delusions. On a number of occasions there were sudden impulsive acts of violence towards others or towards himself. Finally we find the utterance of sentences like the following: "I wish to live a clean life," "I give in my Maker's name," or the senseless repetition of "19." Whether he was oriented could not be determined. Towards the end a condition of muttering delirium and finally of unconsciousness supervened. When we see these traits, namely, the intense excitement, the resistiveness, the fact that he rarely answered questions, the vague delusions, the utterance of sentences like those given, and the sudden impulsive acts, associated with evidences of attention and of understanding questions, we have a picture which, to my mind, is not incompatible with katatonia; and it has indeed certain traits, such as the impulsiveness, the intensity of the excitement, and the resistiveness, the fact that he persistently did not answer in spite of apparently understanding, which speak much in favor of it; even the vague delusions and the peculiarity of his utterances have a certain weight in this

direction. It may of course be questioned whether the two attacks belong together, a circumstance which is of considerable importance, and whether this is not simply a disease which we do not know. This is possible, but it seems more reasonable to regard the two attacks from the same point of view, although it is impossible to prove the necessity of this.

The further objection that this is a case of delirium acutum in the old sense, as a disease *sui generis*, is hardly tenable, the weight of evidence, it must be acknowledged, lying in favor of acute delirium not being a disease by itself. I would then in this case make a probable diagnosis of a condition of acute delirium as a phase of katatonia.

AUTOPSY.—Twenty-four and one-half hours after death. Well-marked rigor mortis is present. About the dependent parts a bluish red discoloration is seen in places. About the upper part of the chest there is a discoloration of a greenish purplish hue. There are a few superficial abrasions about the ankles.

Head.—Skull and dura normal. Pia: Vessels well marked, but there is no hyperæmia, no exudation, pia looks entirely normal. There is no unusual amount of fluid. The pia strips off well. The substance of the brain presents no hyperæmia. Neither on convexity nor on base anything abnormal can be discovered. The vessels at the base are delicate.

The lateral ventricles contain a normal amount of fluid and present in no way abnormal appearances. The same may be said about the third and fourth ventricles. Longitudinal sections through the centrum ovale and transverse sections through the base show no abnormality. Sections were taken from the first frontal convolution, from a place near paracentral lobule, and from temporal and occipital lobes; also section from the lower portion of the medulla oblongata. They were preserved in 96 per cent. alcohol. Transverse section through the medulla showed no abnormality.

Thorax.—The pericardium is perfectly smooth, with a normal amount of fluid. The heart looks rather small. The valves are smooth and delicate. The heart measures from the base of the aortic valves to the apex 10 cm. The aorta just above the valves 6 cm. At the beginning of the aorta there are a few yellowish patches. The coronary arteries are smooth. The thymus is still present, about the size of half a dollar, but irregularly shaped. Pleural cavities are perfectly smooth and contain a normal amount of fluid; the pulmonary pleura on both sides smooth, shiny. Lungs contain air everywhere, the dependent portion particularly looks congested.

Abdomen.—Nothing abnormal found in peritoneal cavity. The liver and gall-bladder show no abnormality. The spleen is not enlarged and appears of normal consistency. The kidneys are of normal size, the

capsule strips off easily, the cortex of normal thickness. Adrenal glands normal. Stomach and intestines show no abnormality. Pancreas normal. Bladder empty, normal. The spinal cord was not removed.

Microscopical examination of the kidneys showed no abnormality, nor was there anything to be found in the liver, numerous specimens of both organs having been examined.

Microscopical examination of the cortex.—Piece near paracentral lobule. With a low power it was seen that nowhere was there any disturbance of the normal arrangement of the elements of the cortex. The neuroglia nuclei do not seem to be present in unusual numbers. The vessels do not stand out prominently. With high power (oil immersion). Largest pyramids. The cell body is usually of light bluish tinge, it has a finely mottled appearance; in the upper part of the cell this is on the border of the visible, whereas lower down it becomes more pronounced, the processes may be seen very far, they answer to the same description as the cell body. The nucleus is often only with difficulty differentiated from the surrounding cell body, since it has about the same intensity of color as the latter and no line of demarcation, but it is absolutely homogeneous, sometimes with a few fairly large pale dots in it. The nucleolus seems not enlarged and is stained a deep blue. In some cells the nucleus may be somewhat better demarcated, being somewhat darker. The pale nuclei may also be seen in some large pyramids.

The large pyramids.—The cell body corresponds to the cell body of the largest cells; here also the finely mottled appearance is seen, which in the lower portion where the cell body may be distinctly darker is more marked; and not infrequently the appearance is then not only mottled, but may show a certain amount of network structure, which may even be quite well marked.

The processes.—The apical process is often seen at a considerable distance, it is usually just as the cell body, finely and indistinctly mottled, sometimes it shows indistinct light streaks, which seem to follow the course of tracts; the others are also seen to a great distance and may be just as the apical process, finely mottled, or at least in the beginning may show a network appearance or be somewhat crumbly. When the base of the cell shows the network appearance very much the processes are apt to be thin. The median basal process is often seen, and answers to the same description as the others. Occasionally there are seen either in the lower portion of the cell body, more especially in the basal, and as it seems above all in the central basal process, irregular lumps which stain very intensely with methylene blue (possibly calcareous deposits of Nissl); they are sometimes quite large.

The nucleus, considerably diminished in size and deeply stained, has a somewhat purplish hue, it is either oval or more longitudinal, the outline is as a rule well marked, but there is nowhere a visible membrane, it is entirely homogeneous and only shows now and then some ill-defined darker spots. The nucleolus is usually enlarged, round, dark, but may have lighter places in it. But the nucleus may also be lighter and less well defined.

The medium-sized and small pyramids answer to the same description. In the medium-sized pyramids the mottled appearance at the base has more frequently the network character, and this is still more marked in the smaller pyramids, where not infrequently the whole cell body presents this appearance; when this is the case the cell is apt to look rather dark, all the processes seem to be comparatively thin and the outline of the nucleus is made out with difficulty; the nucleus then may appear somewhat distorted.

The smallest pyramids of the second layer all have small nuclei, absolutely homogeneous, either round, oval, three-sided with rounded corners, and sometimes with rather large nucleoli, although these are often of normal size. The cell body is frequently much more marked than it is normally, and pale apical processes are often seen. The base often shows a network appearance with these processes arising from it. The whole cell body may also show the network appearance.

Cells in which the nucleus has the character described above and in which there is a balloon-like appearance around it, deeply stained crumbly substance at the base, especially an accumulation at the beginning of the basal processes, are not seen here. The spindle cells of the fifth layer correspond in their description to the larger pyramids especially. It should yet be mentioned that there are quite a number of cells, especially among the larger and medium-sized pyramids, which have a light rim around the nucleus, and in which the cell body is pale and in other ways defective; the nucleus in such instances may be of the description given or may be paler, otherwise retaining its shape and characteristics.

The first frontal convolution answers in its description to that just given, with the exception that here the cells with defective cell bodies are more common.

In the occipital lobe we again find the same characteristics. The cells of the small cell layer show a cell body which presents either a somewhat crumbly appearance or a more distinctly network character; it is much more prominent than normally, has often a distinctly pyramidal or polygonal shape, with processes of the same character as the cell body. The nucleus is homogeneous.

The first temporal convolution does not differ in any well-marked characteristics from other parts of the brain examined; here also there are a rather large number of defective cells.

Neuroglia.—Most glia nuclei have a rather small light rim around them, indications of a cell body being rather rarely seen; around some nuclei some light yellow pigment may be observed. The nuclei are of normal size and have a membrane. The most striking feature about them is that they contain deeply stained, uncommonly coarse granules. It is questionable whether there is any proliferation of glia nuclei. There are no bunches of them which would exceed the normal, nor is there any accumulation along the vessels which exceeds the normal. No mitoses are found. Sometimes neuroglia nuclei are seen lying in indentations and nerve cells.

The blood-vessels show no abnormality in their walls, nor do they stand out prominently when a section is looked at with the low power. In some places the leucocytes are increased within the vessels.

Cerebellar cortex.—In the cerebellar cortex we find essentially the same condition. The cell body has the same appearance as described in the cerebral cortex, that is, it looks finely mottled and often shows long processes of this same character; towards one side or towards the base the mottling may be coarser and look much darker, but it does not present the network character. The whole cell body may appear fainter and more shadow-like. The nucleus may be small and homogeneous, without membrane, but is well demarcated; or it may be somewhat ragged in its outline, or paler with some deeper stained spots in it. The nucleolus appears sometimes enlarged.

Finally the motor cells in the anterior horns at the lower end of the medulla were examined; they were mostly perfectly normal, or showed but slight changes in the chromatic substance around the nucleus, namely, a slight rarification.

We have therefore here a very uniform change which essentially consists in the following: The chromatic substance in the nerve cells is lost. The achromatic substance takes on the stain, this giving rise to a general uniform light stain of the cell body and the processes, the substance looking throughout finely and indistinctly mottled; owing to the fact that the achromatic substance takes the stain the processes are seen at a much greater distance from the cell body than normally. The nucleus is much diminished in size, oval or three-sided, with rounded-off corners, or somewhat longitudinal, perfectly homogeneous and dark, sometimes (in the largest pyramids) lighter, and then a number of usually faint, comparatively large spots are seen in it. The nuclear membrane is never visible. The nucleolus is frequently enlarged. This condition is present in many cells which were examined from different parts of the cortex (place near paracentral lobule, first frontal, tip of occipital, first temporal, cerebellum). But, especially in the small pyramids, there were certain differences to be observed. The cell body, to describe the extremest form, showed a network structure, a honeycombed appearance which may also be present to a certain extent in the processes, at least at the beginning, while the appearance further away from the cell may be more crumbly. The nucleus is also homogeneous; the nucleolus may be enlarged, but the nuclear outline may be less distinct, evidently because it is difficult to see

it on account of the dark network in the cell body. Indications of network structure are seen in the large pyramids, still more in the middle-sized ones, where also typical cells like the one described may be found. From a careful study of the sections it appears that we can see all transitions from the one to the other; it is also evident that these cells with a honeycomb appearance are chiefly present in the small pyramids. I am not prepared as yet to make any statement as to the origin of this appearance and its significance, but I have seen very similar appearances in this region in cases where the change which is here typical was not present. I have even been able to produce experimentally very similar pictures in a rabbit's cortex after death. It is therefore perhaps better to disregard for the present these forms. The same uncertainty I feel in regard to the changes in which the cell body is defective, partly around the nucleus, partly in other portions of the cell body, as it is not excluded that these appearances may be due to post-mortem alterations. That, however, the typical change which I have above described and which is present in very many cells of the most varied description is not due to post-mortem changes I can affirm with certainty, as I am well acquainted with this alteration from a number of other cases. It is this alteration which Nissl has designated by the term "schwere Veränderung" (grave alteration). The appearance of the nucleus is the most characteristic feature. There is a diminution in size of the nucleus, it is homogeneous, there is no visible membrane; other characteristics are, a peculiar purplish hue which these nuclei frequently have, and an enlargement often of the nucleolus. Interesting is the fact, however, that the nucleus does not become round, as in some other cases, apparently undergoing a process of liquefaction as Nissl has described it, but simply diminishing in size and assuming an oval three-sided or longitudinal form. We see therefore no cells that fall to pieces, unless we should consider as such the defective cells described above, with regard to which we are not, however, able to exclude the assumption that they are post-mortem alterations.

I would also emphasize the great severity of the process in the nerve cells as well as its great extent. Whether the dark, small irregular lumps which were found in some of the processes of the larger cells are the expression of calcareous deposits which Nissl has described, I am not yet able to say.

The reaction of the neuroglia consists here chiefly in the fact that the granules in the nuclei are uncommonly coarse, while a proliferation cannot with certainty be asserted. It is deeply to be regretted that no neuroglia fibre stain was used; the fact, however, that the autopsy was performed so late made it appear hopeless to obtain any results. It is particularly to be regretted on account of the probable diagnosis of the case and the interesting finds which Alzheimer has reported in such cases at the last meeting of neurologists and psychiatrists in Baden-Baden.

CASE 2. Unfortunately the information which I obtained with reference to this case is rather incomplete, the clinical history lacking much in detail. At the same time, with the etiology as well as the few symptomatic data which we obtained, there can hardly be any question as to the diagnosis.

George M., 38 years old, a sailor, married, born in New York, entered the Rhode Island Hospital on September 16th, 1896. It is not known whether the patient had been a hard drinker all his life; but it is certain that for several weeks he has been drinking excessively.

On entrance he was very tremulous, and had marked hallucinations of sight and hearing. He says that he can see things around the room, that he sees knives on the ceiling, and that things are falling upon him. He seems to pick up things from the bedclothes that are not there. He seems frightened, is violent, fights and struggles a good deal, so that several men have to hold him and it is necessary to apply the strait-jacket. September 17th. He is in about the same condition, very tremulous and continues to have hallucinations. September 18th. The strait-jacket is removed to-day. Patient is very delirious and his strength is giving out. September 19th. He is failing rapidly. Death the same day.

The autopsy was performed by Dr. Jay Perkins, the pathologist of the Rhode Island Hospital. Nothing abnormal was found in the organs; the brain appeared congested, but was otherwise normal.

I wish to thank Dr. John P. Torrey of the Rhode Island Hospital for sending me the specimens and the above information.

A piece of the paracentral lobule was put into 96 per cent. alcohol at the autopsy and sent to me for examination. The result is the following:

ANATOMICAL DESCRIPTION OF CASE 2.

Microscopical examination. Low power.—The normal arrangement of the nerve cells is not interfered with, it is evident that there is an increase of neuroglia nuclei in the pyramidal as well as in the fifth layers; the vessels are on the whole not very prominent, but now and then a vessel stands out owing to the increase of nuclei around it.

The large motor cells are all very much altered. The following description applies to a characteristic sample. The cell body is an even blue,

not granular, at the same time the term homogeneous would not be fitting, yet the differences in the stain throughout the cell body are on the border of the visible, it may be called finely mottled, sometimes finely and indistinctly mottled, the processes are seen a greater distance than normally, they present the same characteristics as the cell body does, but are on the whole stained less intensely the further one gets away from the cell body. The apical process is not seen such a great distance. In other words, in the processes, as well as in the cell body, the chromatic substance is lost and the achromatic substance has taken on the stain; for this reason the processes are seen for such an unusually long distance. On one side of the cell body there are two well-marked indentations in which neuroglia cells are situated. The nucleus is of normal size, the contents show a very indistinct pale blue design, in which a few somewhat deeper but pale spots can be made out, besides this there is a fairly large number of smaller and larger sharply stained dots apparently distributed irregularly over the nucleus; the membrane is very indistinct.

The nucleolus is approximately round, not altered in size, with many lighter areas, the latter, however, being neither glistening nor well demarcated.

The other cells of this kind show essentially the same characters, sometimes the processes stand out even more sharply, so that side dendrites are well seen; in others the small sharp dots are less pronounced in the nucleus, and the whole nucleus may even be so indistinct that nothing but the nucleolus can be seen, surrounded by a lighter portion which gradually fades off into the surrounding cell body; the typical degeneration forms which will be described later as occurring in other kinds of cells are not seen here.

The large pyramids.—(Here again one characteristic cell is described.) The cell body shows the same appearance as described before, although it is here even farther away from the homogeneous, more approaching a finely mottled appearance. The processes are seen to a great distance, the apical as well as the basal, and even second and third dendrites can be observed; the processes especially, as one gets farther away from the cell, assume somewhat a crumbly appearance. The median basal process (axis cylinder) is seen well; it starts with a broad base, but gradually tapers off and ends in a sharp point. There is here, as in the other cells, not the slightest evidence of any tracts in the cell body or in the processes. The outline of the cell is well preserved, the base somewhat rounded, the cell body possibly somewhat swollen.

The nucleus is large, the outline sharp, the nuclear membrane well marked, the interior rather dark, the structure unusually well marked, it is possible to make out a distinct network, larger pale and smaller sharp dots are seen in the nucleus, the arrangement of these appears partly to be irregular, partly to follow the design of the network. The shape of the nucleus is oval. The nucleolus is not enlarged, looks a uniform dark.

The other cells show essentially the same changes; in some, however, the nuclear outline is less sharp, the network may be less distinct, the

sharp granules not present, or the nucleus may be smaller; again the membrane may be indistinct, consisting of dots, the whole nucleus lighter. Often the shape of the cell is altered, the pyramidal shape with sharp basal angle being lost, and the cells look more club-shaped.

The middle-sized pyramids answer very much to the same description. Here it should be particularly mentioned that no nuclear folds are observed; here the crumbly appearance of some of the processes is particularly seen, and at some distance from the cell even small sharp irregular darkly stained substance portions may be seen in them. The processes may present variations in caliber. It may here be added that all through the section, especially in the pyramidal and fifth, less marked in second layer, free cell processes may be seen which answer to the different descriptions here given of the different cell processes.

Among these pyramidal cells there are seen a small number of cells, the cell body of which answers on the whole to the description of all the others, with the exception that the cell body as well as the processes are darker, the nucleus differs materially, it is very dark blue and homogeneous. The nucleolus is very indistinctly seen, the nucleus may be distinctly smaller and longitudinal.

The cells of the second layer.—In some of these cells the cell body with the processes stands out very distinctly, being of faint blue and answering generally to the description given for the other cells, here also the processes may assume a crumbly appearance and present sharper substance portions. Other cells show but little cell body about them, the nuclei have all a distinct membrane, the shape of the nuclei is either oval, more frequently three-sided with rounded-off corners; they are dark, and in some the design is distinctly sharper than normally, in others this could not be said; sharp dots are but rarely seen, sometimes there are distinct indications of nuclear folds. The nucleoli, which are frequently eccentric, present no unusual features, they are more particularly not pale; there are a number of nuclei which are lighter, in which the nuclear structure and membrane are less well marked, the nucleolus having in some of these lighter portions; but typical degeneration forms are not seen.

The cells of the fifth layer show in every way the characteristics which are seen in the pyramidal layer. Here more frequently the nucleolus is unusually pale with a purplish tinge. This may be the case in nuclei which are otherwise still well preserved, more frequently it is the case in nuclei which are lighter, which begin to have a somewhat indistinct nuclear membrane; some of these nucleoli are even diminished in size, but this is not frequent. Other nucleoli, and this is not very uncommon, have light areas; in some these are quite numerous. These same conditions of the nucleoli, *i. e.* the paleness and the appearance of light places in them, may be seen in the pyramidal cells, but in these it is much less common.

Besides these cell alterations which, as we have seen, show a great uniformity, with the exception of the few cells with very dark nuclei

described among the pyramids, the following forms are seen which apparently are further stages of the cell alterations described, and which must be looked upon as the degeneration forms.

One may see a cell like the following (situated in the lower portion of the pyramidal layer): there is a very pale, roughly, triangular, shadow-like structure with even fainter indication of processes, the whole of somewhat crumbly appearance. The nucleus is only slightly darker than the rest of the cell and has somewhat bluer hue in contradistinction to the more grayish hue of the remains of the cell body; the demarcation of the nucleus is very bad and the outline somewhat ragged, the remains of the nuclear wall are indicated by some dots, the interior shows fairly numerous sharp, darkly stained small granules, besides some fainter specks; no trace of a nucleolus can be made out. Similar forms may be seen where the nucleus is enlarged, others where it is distinctly diminished in size. In some a pale, small nucleolus can still be seen; other cells show a cell body falling to pieces with a nucleus that consists only of a small bit of remains of the nuclear wall seen on one side only, attached to this are the somewhat speckled remains of the nuclear contents with sharp dots in them, the whole showing a somewhat bluish tinge. These degeneration forms are present in the pyramidal layer, especially however in the fifth.

Neuroglia.—As was evident from the appearance with the low power, the neuroglia nuclei are increased in number. This is particularly evident from the bunches of nuclei seen partly near the vessels and partly around the nerve cells; others are seen without apparent connection with either of these structures, in one instance as many as fourteen neuroglia nuclei being counted in a bunch. The nuclei are mostly rich in chromatin and have coarse granules; they have a membrane. Many nuclei have large light spaces around them in which light yellow pigment may be seen; frequently there is a part of the cell body more or less large often attached to the nucleus in a cap-like fashion which contains finer and coarser sharp granules, more frequently the former, and sometimes the margin of the light space is marked with granules. Besides these there are a number of large neuroglia cells in which the chromatin is greatly increased; these have no membrane and there are peculiar nicks or even fairly deep indentations at the periphery.

In the first layer there are seen distinct spider cells showing a rather darkly stained nucleus which has lost its roundness and appears rather crumpled; around it there is a small grayish somewhat crumbly cell body with processes of the same description going in all directions.

The vessels.—The vessels frequently present no abnormality, some stand out prominently, however (partly on account of the neuroglia nuclei surrounding them), and some because they present besides an increase of nuclei which stain darkly, are apt to have very irregular outlines; they are situated immediately on the vessel; the vessel walls are unaltered.

To recapitulate, we find then a uniform change in the nerve cells which shows itself in the following features: the cell body

may look somewhat club-shaped, the chromatic substance is lost and the achromatic takes on the stain. On this account the processes are seen with unusual distinctness sometimes as far as the third dendrites, the axis cylinder is often visible ending in a sharp point, the character of the cell body is neither homogeneous nor granular, but may be described as finely and indistinctly mottled (sometimes this is on the border of the visible), the nuclei are sometimes large, sometimes of normal size, the nuclear wall unusually distinct, the nuclear design uncommonly sharp, numerous sharp granules being present in the nucleus; these are often seen to be distributed in the network; nuclear folds are often absent, and the nucleolus is not enlarged but may show light areas.

The next stage is apparently the one when the nucleus becomes lighter, the nuclear wall more indistinct and less regular in its outline, the nuclear network losing its sharpness, and frequently the nucleolus becoming pale, in a few instances distinctly smaller.

The last stage is that in which the nucleus becomes very pale, either small or very large, often ragged in outlines, the nuclear membrane being only indicated by dots and the contents indistinct, being speckled, with numerous sharp granules. The nucleolus is either of normal size and very pale, or diminished in size and very pale, or no trace of it can be seen, the latter being the most common occurrence. This change corresponds to that which Nissl has described as "acute Veränderung" (acute alteration).

The process in the nerve cells seems to be most pronounced in the fifth layer and least pronounced in the second. The reaction of the neuroglia consists in the following: there are large light spaces around the nuclei, the cell body is visible in parts often having granules in it, the pigment is often well seen, the chromatin is present in coarser granules than normally, and there is an *increase in neuroglia nuclei*. Besides we have in the first layer well-marked spider cells.

REMARKS.

The cell alterations which we have just become acquainted with must not be regarded as in any way characteristic of the two diseases in which they occurred. They both are found in somatic diseases, and it would be absurd to suppose that when we have

the "acute alteration" we have during life the symptoms of delirium tremens, or when we have the "grave alteration" the symptoms of intense impulsive excitement with resistiveness, etc. In a very general way we know the symptoms which occur with these two changes; they consist in somnolence and in coma. When we further learn that both these alterations may develop rapidly (I have seen the acute alteration develop in at most five hours and a half in a case of extensive burns which I studied in Heidelberg), we must acknowledge that even with a knowledge of the changes occurring in these conditions the step in advance is not great, *i. e.* we must not flatter ourselves that we have reached anything like the pathological anatomy of these conditions. The mere fact that the change is so extensive would make us hesitate to draw this conclusion even if we knew nothing with regard to these same alterations in other diseases. There are two possibilities so far as we can see now with regard to the relation of these changes with the two cases we have described, namely: 1. We may assume while earlier in the course of the disease the changes in such cases were slighter and perhaps confined to certain cell regions or cell kinds or certain layers of the cortex, the process became so intense that it produced the more intense and the more extensive changes, and led to death. 2. Or we may assume that the disease, owing to its intensity, produced secondarily a condition which in its turn gave rise to the cell alterations and which came on late in life; by this secondary condition we would of course not mean a pneumonia or the like, but rather the development of a poison. For we can hardly question that these two forms of changes in the nerve cell are due to intoxication. The question would then be, is this intoxication a part of the disease process or is it secondarily induced by the disease process. This, further study and experience will have to teach us.

Very probably more characteristic findings will be furnished when we proceed not only to study the changes in the nerve cells, but, as Alzheimer has done, the entire disease process, more especially the changes in the neuroglia.

DESCRIPTION OF PLATE.

- a.* Case No. 1. "Largest" pyramidal cell from the upper part of the anterior central convolution.
- b.* The same.
- c.* Case No. 1. Large pyramid from the first frontal convolution.
- d.* Case No. 1. The same with defective cell body.
- e.* Case No. 1. Purkinje cell.
- f.* Case No. 1. Cell from the anterior horn; almost normal, only slight rarification of chromatic substance in cell body.
- g.* Case No. 1. Small pyramid from first frontal convolution.
- h.* Case No. 2. Large pyramid from paracentral lobule.
- i.* Case No. 2. Cell from pyramidal layer showing the terminal stage of the cell alteration represented in *h*.
- k.* Case No. 2. Neuroglia nucleus enlarged, with increase of chromatin, loss of membrane, and nicks at the periphery.
- l.* Case No. 2. Small pyramid from the upper part of pyramidal layer.



SIR JOHN CHARLES BUCKNILL, M.D., F.R.C.P., F.R.S.

In this issue of the Journal we present a portrait of Sir John Bucknill, or as he is more familiarly known on this side of the Atlantic, Dr. Bucknill. In the brief obituary notice which appeared in a former number it was intimated that a more extended notice would appear later, and we are happy to be able to accompany this notice of so eminent a member of the medical profession and one who has contributed so much to the literature of our specialty with such an excellent portrait.

Dr. Bucknill was born on Christmas day, 1817, at Market-Bosworth in Leicestershire. His father, Mr. John Bucknill, was a surgeon practicing at that place. He was educated at the grammar school of his native town, and subsequently at Rugby under the famous Dr. Arnold, the imprint of whose teachings can be seen in much of Dr. Bucknill's subsequent work and writing. He entered University College in 1835 and in 1840 took the degree of Bachelor of Medicine, subsequently becoming a house surgeon at the University College Hospital under the famous Liston. Sir John Erichsen and Sir Richard Quain were among his contemporaries. Dr. Bucknill carried on a private practice at Chelsea for a short time until his health broke down, when he removed to Devonshire, and in 1844 was appointed the first superintendent of the recently erected county asylum, which position he held until 1862. Entering upon his asylum work without any previous training in psychiatry or in the management of institutions for the insane, Dr. Bucknill, while lacking the advantages which previous opportunities would have given him, was nevertheless freed from the trammels of tradition and habit and was able therefore to mark out a course for himself which rendered his management of the Devonshire Asylum in some respects unique, and which at the same time attracted the attention and warm commendation of the Commissioners in Lunacy. He was one of the earliest to devise the cottage system, and as early as 1859 placed suitable patients in cottages under ordinary family care, contiguous to the asylum buildings.

It is more, however, as a contributor to the literature of the profession that Dr. Bucknill's name will be remembered. In 1853 the first number of the *Journal of Mental Science*, then known as the *Asylum Journal*, published by authority of the Association of Medical Officers of Asylums and Hospitals for the Insane, subsequently the Medico-Psychological Association of Great Britain and Ireland, was issued under the editorship of Dr. Bucknill. Dr. Bucknill continued to conduct the *Journal* until September, 1862, when he resigned the office of editor of the *Journal* and the superintendency of the Devon Asylum upon his appointment to the position of Lord Chancellor's Visitor. A special meeting of the Association, under whose authority the *Journal* was published, was called and the following minute was adopted: "The members of the Association, sincerely congratulating Dr. Bucknill on his appointment to the important office of Visitor to the Chancery Lunatics, have to express their regret that the responsible duties now devolving upon him are incompatible with his continued superintendence of the '*Journal of Mental Science*,' and on receiving his resignation of its editorship, beg to offer him a grateful and cordial expression of their appreciation of his valuable services during a period of nine years. They feel assured that Dr. Bucknill will not cease to take an interest in whatever relates to psychological science and its application to medical treatment, and they trust that he may long enjoy his increased opportunities of promoting the welfare and the protection of the insane, and the real interests of the medical profession in relation to insanity, and which they believe to be inseparably connected with the real advantages of the community." This minute, it is interesting to know, was offered by Dr. Connolly.

Dr. Bucknill was succeeded by Dr. C. L. Robertson, afterwards, like himself, Lord Chancellor's Visitor in Lunacy. It is an interesting coincidence that these two men, associated as they were in the earlier development of the Medico-Psychological Association and of its *Journal*, passed away within two months of each other, Dr. Robertson dying on the 18th of May and Dr. Bucknill on the 20th of July. Dr. Bucknill's contributions to the *Journal of Mental Science* were all of a most interesting character. Many of his reviews were quite characteristic of the

man and can be easily recognized by those acquainted with his style and his methods of thought. He was extremely frank and outspoken, sometimes becoming somewhat offensive; and in his reviews of books which met his disfavor his criticism was by no means clothed in guarded language. We have before us an example in a review of a work which at the time attracted considerable attention, and while there is no question as to the correctness of much of the criticism, we cannot but query as to how much the strained personal relations between the author and the reviewer may have contributed to the character of the review. Speaking of the general style of the work he says:

"He cries up his wine, then sells us vinegar." "He begins with an introduction. In this introduction he rambles on, pouring forth whatever comes into his thoughts. He never looks before him, or behind him, to the right, or to the left; he hurries on, mistaking garrulity for inspiration, and the result is the production of a chapter which, like the rest of the book, consists of wordy declamation and inflated insipidity; or at the best, one inextricable compound of tares and wheat, chaff and grain."

His greatest work and the one by which he will be probably known is the *Manual of Psychological Medicine*, written in conjunction with the late Dr. D. Hack Tuke. The first edition of this work appeared in 1858 and it has passed through at least three subsequent editions, the second edition appearing in 1862, the third in 1873 and the fourth in 1879. To this manual Dr. Bucknill contributed the chapters relating to Diagnosis, Pathology and Treatment of Insanity. Other smaller works to which Dr. Bucknill has given his name are: "*Habitual Drunkenness and Insane Drunkards*," published in 1878, and the "*Care of the Insane and their Legal Control*," in 1880. In this last volume his strictures on private asylums made him unfortunately many enemies, but no man with Dr. Bucknill's force and outspoken courage of his convictions could fail to make enemies. He was an ardent champion of every cause which he espoused, and as violent an enemy of every cause or course which seemed to him wrong.

Dr. Bucknill did not confine his writing nor his interest to merely medical topics. In 1859 he wrote a work on the *Psychology of Shakespeare*, and in 1862 another upon the *Medical*

Knowledge of Shakespeare. Both of these works show most excellent literary ability and critical analysis. In the *Asylum Journal of Mental Science* for July, 1858, appears one of these studies entitled, "Macbeth, a psychological study." That Dr. Bucknill took a keen interest in the best literature and manifested an intelligent and medical knowledge thereof is shown in many of the reviews in the *Journal of Mental Science* while under his editorial supervision. An excellent example of his critical ability is shown on page 95 of the second volume, a review of Maud and other poems by Tennyson, signed with Dr. Bucknill's initials. This review covers nine pages of the *Journal* and is a careful and painstaking analysis of the psychological questions involved in some of Tennyson's work. He says, after referring to Shakespeare, "The study of mind in its irregular developments appears to have as great a charm for the great English poet of the present day as it had for that prince of song. The writings of Tennyson are peculiarly metaphysical, or, to use the new term, psychological. His 'Two Voices' and 'Palace of Art' display wonderful psychological insight, and his new poem is neither more nor less than the autobiography of a mad man. The critics have found great fault with Mr. Tennyson for choosing so disagreeable a hero, and have designated the wild poetry, wonderfully true to nature, in which the inner life of this morbid mind is depicted, as spasmodic and unpleasant. . . . Let others criticise the beauties of the poetry or the irregularities and novelties of the metre; the point of view we take is, the powerfully and faithfully drawn mental history."

In 1875 Dr. Bucknill visited America and was present at the annual meeting of the Association of American Asylum Physicians in May of that year, when he was elected an honorary member of the Association. There are many readers of the *Journal* who remember Dr. Bucknill's visit to this country and who were much impressed by his personality. He visited several of the American institutions for the insane, and in his notes on American asylums, published after his return home, with their outspoken and free criticism, to those who did not understand the downright honesty of the author, coupled as it was with a liberal allowance of what Americans are pleased to call insular prejudice, some of his strictures may have appeared un-

necessarily severe. He had, however, many warm friends in America, and his uniform kindness to visitors from this country who were fortunate enough to come in contact with him made him many more. He was, as has been stated by his son, Col. Bucknill, "demonstrative in wrath." He was likewise outspoken and frequently severe in criticism. Those who remember Dr. Bucknill will readily recall his magnificent physique. He was over six feet tall and was well proportioned. It is probably due to his keen interest in all matters of outdoor sport and exercise that he early took an interest in the Volunteer movement in Great Britain. He was, as we have stated in a previous notice, the first volunteer in the now thoroughly organized Volunteer organization of England, and it was probably much more largely on account of his interest and active support of the Volunteer movement that he was knighted in 1894, than because of a desire to reward his, to us, much more important and distinguished services in his chosen profession. Active in all that he undertook he was an illustration of Whittier's description:

"Loathing pretence, he did with cheerful will
What others talked of, while their hands were still."

E. N. B.

Medico-Legal Notes

ONE ASPECT OF FEIGNED INSANITY.

By H. E. ALLISON, M. D.,

Medical Superintendent Matteawan State Hospital.

The simulation of insanity implies that there is some purpose to be gained which the simulator has in view and which actuates his conduct. Where no object is apparent, and where none is suspected, the question of feigned insanity seldom arises. The important point to be determined in every doubtful case is, what benefit can come to the malingerer from his efforts at deception. Criminal offenders furnish the majority of instances wherein doubt as to the existence of actual insanity is apt to arise, and yet such persons, even when proven in some measure to be impostors, are often really insane or suffer from a degenerate mental and physical condition which renders them actually irresponsible for their acts.

An illustrative case is that of a youth named K., a native of Buffalo, who was accustomed for some years to display attacks of feigned epilepsy, whereby a crowd could be collected in the street and their pockets picked by his confederates. His manner of procedure was very clever and adroit. He would secure a piece of soap and by cutting his tongue produce a bloody froth at the mouth, the spasms were exceedingly well imitated, and the general appearance of the boy was all in favor of his deception. He would also exhibit similar seizures at other times, when alone, for the sake of sympathy and in order to secure alms or a comfortable place in which to sleep for the night. For some petty offense he was committed to the penitentiary and finally received a sentence to prison. There he was placed at a task which was distasteful to him and which he feared he could not perform. He told the prison authorities he was subject to epilepsy, and his statement not being heeded, he was one day seized with a con-

vulsion while in dangerous proximity to the machinery of the shop. As a result he was soon after sent to the Auburn Asylum for Insane Criminals. There the fraud was detected and he finally confessed his whole history. His term of sentence has now long ago expired, but he is an imbecile of such an inferior grade that he has been detained in custody, although he has not had a convulsion in more than six years. Formerly, if asked to do so, he would give an exhibition of his skill in this direction, but latterly, being out of practice, he absolutely refuses to attempt it and apparently is ashamed at his detection.

No doubt all hospital superintendents having care of the insane are familiar with rare instances wherein lunatics have taken a certain degree of pleasure in displaying before visiting strangers certain actions calculated to alarm them and which were purposely assumed with that object in view. Such a one was J. If not carefully watched by the attendants he would take great delight in making such exhibitions of himself, and upon one exceptional occasion, in an excess of zeal, he smashed out the panel of a door behind a departing company of visitors. He would usually laugh about his pranks afterwards. A word would control him, but it was not always possible to keep an outlook for him, and for that reason he was for a long time kept out of the path of visitors upon a retired ward. He was undoubtedly insane, and yet he exaggerated his condition. Finally his transfer took place to another hospital. Some years afterwards, in passing through its wards as a visitor with a large delegation, I found J. engaged in the same antics, which the attending physician assured me were harmless, though threatening. He recognized me and desisted long enough to greet me and express his pleasure at our meeting again. He had, however, failed considerably in his physical condition and soon afterwards died at the asylum.

The application is this: If an insane person for a playful purpose can heighten his condition for the amusement it affords him, or if an imbecile can sham epilepsy successfully or even moderately well, would it not be possible for another degenerate or for a chronic lunatic or paranoiac to do the same in order that he might escape punishment, gratify his vanity, obtain relief from the hard conditions of life, or even to gratify a weak and

morbid fancy or to receive the mere pittance of a trifling reward? We simply call attention to the fact that because an individual is found to be shamming to a greater or less degree it does not always necessarily follow that he is sane. It is possible for such a person to be both insane and at the same time a feigner. Most authorities agree that the underlying conditions in nearly all malingerers is one of physical and mental degeneracy, joined to a bad heredity, and much of what is feigned is often related to a state of actual insanity.

A recent case would seem to be in point—that of Prentiss or Prattis, to which the Philadelphia press has given considerable prominence. A colored convict was exhibited at the clinic at the University Hospital as a case of feigned insanity. He had formerly been an inmate of the Eastern Penitentiary, and had been pronounced insane by a commission appointed by Judge Gordon to investigate the affairs of that institution. The patient seemed to enjoy the large audience of students before whom he gave an exhibition, by tearing open a bed sack and scattering the straw, talking with an imaginary Mrs. Vanderbilt, dancing and uttering loud cries. He illustrated how he had eaten his food from a tub, how he besmeared his cell walls, and offered to show in many other ways how he created disorder in the prison, and yet he had only recently received his discharge from the institution, wherein he had exhibited marked signs of insanity for upwards of a year and without any apparent motive. While undergoing sentence he was regarded by the prison physician as a case of sub-acute mania; he claimed to be Jesus Christ. He was noisy and boisterous, especially after midnight. He often destroyed his bedding; he had been clubbed and tied to the steam pipes by his cell mates on account of his noise and turbulence, and his body was scarred with burns thus inflicted. His habits were also very filthy. He continued these manifestations until shortly before the expiration of his sentence, when he became quieter and was discharged at the end of his term of imprisonment. It is very questionable if this man was a feigner; indeed, the probability is strong that he was actually insane. The fact that he exercised a measure of self-control shortly before his term expired does not prove his sanity, for any one who has had experience with the criminal insane knows that it is a common

occurrence for indubitable lunatics to conceal and deny their delusions at such a time, often to break out with greater violence than ever when this period has passed. There is a popular belief that feigned insanity leads to an onset of the actual disease, but the presumption, in the great majority of such cases, must be that the earlier manifestations are evidences of true mental derangement and are not assumed. In the degenerate individual delusions of a marked nature and dangerous intensity often lurk deep, and the patient is cunning and wary, so that the surface indications without careful study of the man's history and behavior are apt to be misleading. Pure simulation in the case of a person sound in mind and body is rare.

A very interesting case of true insanity once came under my observation, interesting because of an extremely plausible but spurious confession made by the patient that he was a feigner. A young man, twenty-seven years of age, was committed to our custody from prison. His history showed that he had been sleepless, had persistently refused food for fear of being poisoned, was noisy at night, had assaulted officers whom he thought intended to kill him, and finally attempted suicide by cutting his throat. He created great disturbance in the prison and had been removed to a large room away from others, where he was placed in restraint. At the time of his attack he had only a few weeks to serve until the expiration of his term, and would then have been released from prison had he not become insane. Soon after his admission to the asylum he talked coherently, appeared cheerful, slept well for a few nights, and expressed no delusions. On the twelfth day after his reception he asked for an interview and then stated that he had feigned insanity. His story was that he wished to reform upon his discharge from prison, and in order not to return to his old associates and temptations in New York city he had asked the warden at Sing Sing for a transfer to Auburn prison. During his confinement he had learned shoemaking, and Auburn was several hundred miles nearer to Rochester, a center of the shoemaking trade, than Sing Sing. If his transfer had been granted he would have profited in this manner. At Sing Sing, upon his discharge, he would have received an allowance and the railroad fare of fifty-eight cents to the county of his conviction, a total of \$10.58, out

of which, in order to reach Rochester, he would have had to pay about \$7.00 for a ticket, leaving him a balance of a little more than \$3.00. On the other hand at Auburn he would have received the same allowance and also his railroad fare to the county of his conviction; which from that point would have amounted to about \$6.50, a total of \$16.50, out of which, by reason of Auburn's close proximity to Rochester, he would have had to expend only a trifle in order to reach his destination. His request for such a transfer was denied, and thereupon, upon advice of a fellow convict, he shammed insanity, intending to gain his point by securing his removal to the asylum which adjoined Auburn prison. By there confessing his deception he expected to obtain his transfer to the prison itself, as it was the custom at the asylum to send all patients upon recovery to that prison. It was a very clear, coherent statement, and when questioned about his delusions he was equally shrewd. He stated that he never entertained a fear of being poisoned, but assumed it; and that he refused his food, but really secretly obtained from a friendly convict all he required to eat; that he shouted in a boisterous manner "murder! murder!" simply to create the belief that he was insane; that he assaulted officers for the same reason, but never really thought that they intended to harm him; and that the attempt at suicide by cutting his throat was also a part of his plan, and as a proof he showed that the wound was of a most trifling character, which was true, as it was slight and had not required any stitching. He said he had to do something, but that he knew enough not to hurt himself. In this case all his motives seemed to be extremely rational; but, notwithstanding his story, he was believed to be insane, particularly from the consistency which was displayed in the history of his delusions. When analyzed there was found to be a unity among them all, which pointed to insanity. He believed he was to be poisoned or killed by one of the officers, he shouted murder at night and called for help, and finally in despair he attempted to cut his throat. It was a realistic picture of mental derangement confined to one type and without any mixed features to obscure its truthfulness, and the patient was therefore returned to the ward for observation. It then appeared that after admission he had related some of his delusions

to a fellow-patient, who told him that if he made public any such ideas while at the asylum he would not be discharged upon the expiration of his term, but would be held indefinitely. The change in his surroundings from the prison to the hospital had in his case a quieting effect, and the alertness of his mind and his acute perception, thereupon enabled him to devise apparently most reasonable motives for all his acts in the story which he related. A week after his confession he completely broke down, his old ideas returned in force, with many new ones of the same nature; he became very voluble, talkative, filled with delusions and actively disturbed, in which state he continued until his transfer to another asylum, where he still remains, and after eight years' confinement is now in a condition of terminal dementia.

Experiences of the character such as we have related are not confined to convicts alone, but are often had with unconvicted criminal patients committed by the courts. It is rare, of course, that they are so well acted as in the case last described, for, as a rule, patients cannot conceal their delusions, the fact of their insanity being too evident to admit of doubt. Many difficult problems arise, however, in which it is wise to be conservative, to have as much time as is possible for observation, thoroughly to dissect every motive, to consider carefully the nature of each form of special derangement, and to bear in mind the peculiar aspect of simulation to which allusion has been made, namely, that feigning may be practiced or "confessed" even by those who are actually insane.

Notes and Comment

PSYCHIATRY AND HISTOLOGY.—Those who had the pleasure of listening to the address given by Dr. Ira van Gieson before the Neurological Society of Baltimore on the evening of February 16th, had clearly brought before them the intimate relations which are springing up between the science of psychiatry and that of histology or general anatomy. The subject as announced was "The Toxic Basis of Neural Disease," and the speaker in the course of his remarks dwelt at considerable length upon the histological appearances of normal nerve cells and the alterations which occur in these as the result of disease.

Dr. van Gieson, in agreement with many investigators of the present period, is of the opinion that the majority of diseases of the nervous system (in which category he includes, of course, diseases of the mind), like many diseases of the other tissues of the body, are to be led back to some form or another of "poisoning." The particular nature of the toxic agent concerned varies with the individual cases. Sometimes external poisons of mineral, vegetable or animal origin by some means or another gain an entrance to the body; of these, lead and arsenic, bacterial products, and the poisons which result from the metabolic activity of malarial parasites, will serve as examples. In other instances (the so-called auto-intoxications) the poisons appear to have their source in the body itself, either as a result of imperfect elimination of the normal products of tissue metabolism (as in uræmia), or in actual perversion of the metabolic processes of one or more of the tissues or organs, this in turn being dependent upon hereditary faults, an unfavorable environment, or both. It is probable that in many cases both external poisons and poisons produced by the body itself join forces to do injury.

In developing his subject Dr. van Gieson marshalled with care the various points which can be adduced as evidence in favor of the view that nervous diseases are toxic in their origin,

and he did much to make his exposition lucid by comparing the acute and chronic changes which take place under different conditions in the parenchyma and stroma of an organ like the kidney, with similar acute and chronic alterations occurring in the nervous tissues.

The most forcible of the data thus far accumulated in support of the doctrine in question are undoubtedly those which have been yielded by the application of the microscope to the study of the nervous system. Histological studies of the tissues from different parts of the nervous system (and the results of a great mass of such studies are now at hand, thanks to the lively activity which has been manifested in this field of work by physicians in England, Germany, Russia, Italy, France, Belgium, Roumania and America) have discovered in cases of poisoning, not only in those occurring accidentally, but also in those experimentally produced, marked alterations in the appearances of the bodies and processes of the highly differentiated elements of which these tissues are composed.

In some instances the portion of the neurone showing the most striking changes in appearance is that which, in fixed tissues stained with dyes like methylene blue, thionin, or toluidin blue, retains, on differentiation, the coloring matter with especial tenacity. This part of the nerve unit is known variously as the "stainable substance" (Nissl), the "chromatic" or "chromophile" part, the "tigroid substance" (v. Lenhossek); Dr. van Gieson, for reasons not wholly clear to us, calls it the "collagenous substance." Present in the living nerve cell in solution, this "tigroid" is precipitated on treatment with fixing reagents (Held), often in the form of characteristically shaped masses (the so-called Nissl bodies), in the same sort of nerve cell, apparently always (in health) in almost the same way. So constant are the appearances in different groups of healthy nerve cells (for example, in the motor cells of the ventral horns of the spinal cord, in the Purkinje cells of the cerebellum, in the large pyramidal cells of Betz in the paracentral lobule), that elaborate classifications of nerve cells have been constructed, based upon these alone.

In other cases, probably in severer forms of intoxication, in addition to the changes in the appearances and distribution of

the "tigroid," distinct alterations can be made out in the other portions of the protoplasm of the nerve cell. Dr. van Gieson appears to have very definite views concerning the finer structure of this portion of the protoplasm. In addition to the so-called "pigment" (his "metaplasm granules") and the "tigroid" (his "collagenous substance") he finds in the nerve cell a distinct reticulum which extends throughout the cell body and all its processes (dendrites and axone). There may be, he thinks, though he expressed himself with reserve upon this point, a difference between the reticulum in the dendrites and that in the axones. Filling up the interstices of the reticulum, and bathing it, is the softer, more fluid part of the nerve cell, the cell sap. The "collagenous substance," the speaker believes, forms, in the living cell, one of the constituents of the cell sap. Very interesting experiments on the nerve cells of the cockroach were described, in which it was found possible to squeeze out the cell sap, leaving only the cytoreticulum behind, as was demonstrated by staining. Dr. van Gieson looks upon the cytoreticulum as a contractile part of the nerve cell protoplasm, and imagines that, extending into the dendrites, it may enter into the formation of the "gemmales" present on many of these processes.

Much as the final word bearing upon the ultimate structure of the nerve cell is to be desired, a review of the bibliography quickly convinces one how far distant from it we are. Dr. van Gieson's view of the structure of protoplasm is most nearly in accord with the doctrine of Leydig and Schaefer. The "spongioplasm" of these investigators agrees with Dr. van Gieson's "cytoreticulum," and the "cell sap" of the latter is the "hyaloplasm" of Leydig and Schaefer. Van Gehuchten supports a similar view, and the observations of Flemming, Dogiel, Lugaro, Levi and others who believe in a "fibrillary" structure, though at first sight dissimilar, are found on close examination to differ from it but little.

On the other hand, there are several groups of investigators, among them many well trained men, who maintain a different attitude with regard to the finer structure of the protoplasm of the nerve cell. The whole school, at the head of which Bütschli stands, oppose the doctrine of a "reticular" as well as the doc-

trine of a "fibrillary" structure. The members of this school believe that protoplasm, as seen in fixed tissues under the microscope, has a "honeycomb" or "foam" structure. What look like fibrils of a reticulum are, they assert, sections of the walls of the "honeycomb structure" or of the vacuoles. Where distinct longitudinal fibrils are to be made out, by more suitable methods of preparation and examination (media of low refractive index, feeble illumination), they can, they tell us, observe delicate cross fibrils connecting the longitudinal fibrils (or as they would prefer to put it, they see the sections of the thin end walls of oblong chambers connecting with the sections of the thicker side walls). The active and careful young Leipzig neurologist, Held, has recently gone over this whole ground, exercising apparently every precaution as to his technique, and, with certain reservations which cannot be entered into here, has placed himself on the side of Bütschli.

The strife between members of these two schools, and the lesser struggles in which the supporters of still other views concerning the morphology of protoplasm have taken part, have occupied the attention of microscopists for some years, and every Year-Book contains an epitome of arguments new and old, *pro* and *con*. Those not familiar with the different views concerning the structure of protoplasm in general will find excellent epitomes of the whole subject in the text-books of E. B. Wilson, O. Hertwig, and Yves Delage, or in the lucid article of the Berlin anatomist, Waldeyer, which was published in the *Deutsche medizinische Wochenschrift* in 1895. The views of Dr. van Gieson, coming as they do from one whose name has long been well known to all who employ the technical methods of the histologist, are worthy of the closest attention and consideration, even if for the present it is necessary to leave the subject open.

After a statement of his views concerning the normal structure of the ground substance of protoplasm, Dr. van Gieson proceeded to a discussion of the various morphological changes to be met with in this in different forms of intoxication. His findings in diseased tissues are of especial importance, illustrated as they were by careful drawings, and to all psychiatrists interested in this department of work the reading of Dr. van Gieson's report, which we understand is to appear in an early number of the *States Hospital Bulletin*, cannot be too highly recommended.

The Pathological Institute of the New York State Hospitals is to be congratulated upon the results thus far attained in the work which it has undertaken. No one who heard Dr. van Gieson's address could fail to be convinced of the importance of the field which is being opened up, or to be encouraged at the progress which has already been and is still being made. Psychiatrists have been somewhat tardy in their domain in feeling the full force of the query of Morgani, *Ubi est morbus?* They have not heeded as they should the words of Bichat, *Qu'est l'observation, si on ignore là où siège le mal?*, notwithstanding the fact that in other departments of medicine the significance of these questions has long been generally appreciated.

One hundred years ago a great French psychiatrist and pathologist by his writings stimulated to activity a young man in Paris, who in the work of a few years founded a new science, that of General Anatomy or Histology. In his *Traité des Membranes*, published in 1800, Bichat stated that he owed his ideas regarding the relations between the different structure and the different affections of the membranes to the reading of the work of Pinel. It is very fitting that, as we enter the 20th century, histology should begin to pay back its debt to psychiatry. Histologists should not forget, however, that they will best celebrate this centenary by offering as a gift, accurate observations and objective descriptions shorn as far as possible of theories and hypotheses, no matter how pleasing and seductive the latter may appear. The contributions of Ramón y Cajal would be all the more appreciated if he had refrained from writing the article in the *Archiv für Anatomie u. Physiologie*, Anat. Abth., 1895, in which he has developed his astounding theories about the neuroglia, and we question whether Rabl-Rückhard or Duval would ever have advanced the hypothesis of amœboid movement of the dendrites could they have foreseen how far this hypothesis would lead some of the contributors to current psychiatric bibliography.

IMPORTANCE OF GOOD HEALTH TO THE FEEBLE-MINDED.—The Annual Report of the State Board of Charities of New York, recently submitted to the Legislature, contains a highly suggestive paper by Dr. J. C. Carson, upon "The Importance of a High Grade of Physical Health in Feeble-Minded Inmates

of Public Institutions, with a View to their Right Development and the Best Method of Securing such Health." Dr. Carson's large experience enables him to fortify his argument with instances of the direct effect upon mentally ill-developed children of improvement in the physical condition. In one case of a feeble-minded boy, who came under observation suffering from a bad favus of the scalp, immediate and very pronounced mental improvement followed upon the treatment and alleviation of the disease. His improvement was so great that his mother removed him from institutional care, satisfied that he was a normal child.

The consideration of the high V-shaped palate brings out some interesting facts. Dr. Langdon Down regards it as diagnostic of certain types of feeble-mindedness. Dr. F. H. Hooper, of Boston, believes that these high palates are caused by adenoid growths in the nasopharynx. An examination of the higher grade children in the Syracuse State Institution, by Dr. Halsted, showed that twenty per cent. had adenoids sufficiently large to cause mouth breathing. The almost magical results following their removal in otherwise normal children have been paralleled by cases among feeble-minded. The reports include a case of successful treatment of sporadic cretinism.

Dr. Carson further refers to the general physical defects and the hereditary phthisical and scrofulous taint of so many of the feeble-minded who improve mentally under proper hygienic surroundings. The means adopted to this end are practically the same throughout the civilized world. The most important is a proper dietary, which should contain a good supply of nitrogenous, phosphatic and oleaginous elements in a form easy of mastication. Milk, oatmeal porridge, entire wheat flour and green vegetables should enter largely into the list. Close attention should be given to the bladder and bowels, many flights of temper and intractability being directly traceable to a clogged bowel. Frequent baths with friction are necessary. Warm clothing with frequent changes is important, and the strictest attention must be given to the ventilation of wards and school rooms. All of the voluntary muscles should be daily called into play by calisthenics and gymnastics, and use should also be made of galvanism and massage. Dancing, out-door sports, regulated and systematic walking in pleasant weather, and military drill, all

contribute to the general mental and physical improvement. The experience of the past fifty years leads in the direction that efforts should more be given to the training of the hands rather than the intellects of feeble-minded children. Occupation is the great remedial factor, and the school affords the best means for moral, physical, industrial and intellectual training.

THE ASSOCIATED STUDY OF EPILEPSY AND THE EPILEPTIC.—From a pamphlet recently issued on this subject by Dr. William P. Spratling, Medical Superintendent of the Craig Colony for Epileptics, Sonyea, N. Y., it would appear that the organization of a national society or association for the study of epilepsy and the care and treatment of epileptics is possible, and that such a society, if properly organized, would have a decided sphere of usefulness.

Thirty-five circular letters were sent out by Dr. Spratling to various prominent physicians, scientists and philanthropists, inviting opinions on the subject, and to these thirty replies were received, twenty-three of which were favorable, three neutral and four opposed.

The author of the pamphlet is of the opinion that such a society if founded should plan its work along broad and comprehensive lines, and summarizes the proposed work it should do under the following heads:

- 1st. The scientific study of epilepsy.
- 2nd. The rational treatment of the disease.
- 3rd. The best methods of caring for dependent epileptics, including—
 - a. The construction of proper homes based upon a study of the epileptic's needs as to classification and environment.
 - b. The study of the utilization of the epileptic's labor, for economic, scientific and ethical reasons.
 - c. The study of the best educational methods to be employed, including manual, industrial, intellectual and moral forms and forces.

It seems to us that such a society might serve a valuable purpose in investigating, collecting, preserving and distributing data relative to epilepsy, particularly so in view of the fact that the epileptic is coming more into prominence as a public charge.

There is one thing certain, and that is, that a vast amount of ignorance exists about this widely prevalent disease. Physicians charged with the medical care and treatment of epileptics in public institutions soon find this out. There is no better way to educate the public at large than through the organized efforts of such a society.

The scope of the society's work, as indicated by Dr. Spratling, should be broad. Its committees should include investigators of the highest scientific attainments, skilled neurologists and physicians conversant with the disease from the standpoint of the clinician and its treatment, and practical workers in charity of all kinds whose mission it is to relieve distress wherever found.

We hope the effort to organize such a society may be successful, and that when organized it may incorporate in its membership earnest and honest workers, whose efforts to inquire systematically and minutely into the causes of this disease may meet with abundant encouragement and success.

HASHEESH.—The JOURNAL has recently received a copy of the Report on the Egyptian Government Hospital for the Insane for the year 1896, which contains, among other interesting facts, the following note regarding hasheesh:

Haheeshism still remains the most potent cause of insanity in Egypt and heads the list in the foregoing table. There is also reason to believe that of the 128 male cases of which the cause is stated to be unknown, many are due to hasheesh. However, excluding cases where, although the cause is given in the certificate as hasheesh, no confirmation of that statement was obtained from the patient or his friends, there still remain 83 male and 7 female cases almost certainly due to hasheesh. Thus, of 330 male cases admitted in 1896, 83, or 25 per cent, were ascertained to be due to hasheesh; possibly the real percentage of male admissions caused by hasheesh is nearer 50.

The 83 male hasheesh admissions consisted of 45 cases of mania, 19 of weak-mindedness or chronic dementia, 16 of intoxication, and 3 of mania of persecution. The average residence in hospital of hasheesh cases admitted and discharged during 1896 was 40 days. Of the 83 cases, 28 came from Cairo and 11 from Alexandria. Their occupations were various, but a large

number were beggars and pedlars, and almost all were destitute; three were fellaheen and a few were criminals. Their ages varied from 20 to 60 years.

The motives given for the hasheesh habit varied; the majority alleged that they smoked the drug to make them feel jolly: others used hasheesh on account of its aphrodisiac properties, and several stated that the habit only commenced on their marrying. A number of patients alleged that they took hasheesh to soothe them when annoyed or depressed; it was not rare to find a convalescing patient urge as a reason for release that since he had taken hasheesh to calm his angry feelings and to prevent his injuring his neighbors, his lapse should be regarded as due to a praiseworthy motive. Certain patients on becoming insane from other causes took hasheesh as a remedy. In some cases it was difficult to decide whether the insanity was the result of grief or of the hasheesh in which the individual indulged to forget his sorrows. The majority alleged that they did not spend more than 1 or 2 piastres daily on hasheesh: a few admitted smoking all the hasheesh they could buy or beg. One individual, formerly an omdeh, stated that he grew his own hasheesh.

Some individuals combined opium eating with the hasheesh habit, and both drugs were found from time to time in the pockets or ears of newly admitted patients. The seven female hasheesh consumers admitted were either public women or servants in native cafés.

INTOXICATION AND NERVOUS DISEASE.—The toxic origin of many pathological conditions which arise in the human body has been made manifest, and what a few years ago was regarded as simple theory is now recognized as a well-established fact. The past quarter of a century, particularly the last decade, has yielded so much exact information regarding the sources and the nature of the agents of intoxication, that these now form a class of etiological factors as definite as any which are known in connection with the causation of disease. The knowledge of the action upon the animal economy of such definite poisons as lead, mercury and alcohol has been supplemented and much extended by the study of the organic response to the bacterial toxins and to certain substances of an injurious character en-

gendered within the body itself. Thus what has been among the most unsatisfactory, because the least developed and most fanciful, of the chapters upon etiology has, largely through modern chemical and histological laboratory research, become one of the most promising fields of study. At the present time we possess definite and more or less comprehensive data relating to the extent and manner of the action of not a few organic and inorganic poisons upon the various organs and tissues.

Perhaps the most important contributions have been from the study of the organic poisons, especially those yielded by the pathogenic bacteria and those resulting from disturbed organic metabolism giving rise to the condition known as "auto-intoxication." But important as is this latter group—and the future has much in store for the diligent student, with modern methods at his command, who undertakes to work out in some measure the nature and effects of these elusive substances—for the present our energies must be devoted chiefly to the bacterial toxins. The human race is peculiarly exposed to and very susceptible to invasions of harmful parasitic micro-organisms. Beginning with the invasion of the exanthematous host and ending with the germs of influenza and of pneumonia, human life for each period has its especial set of enemies. Each invader comes armed with a destructive and often deadly poison or toxin, which we must now believe may be left behind to work further damage even after the enemy itself has been overcome or ejected. Let us examine one or two concrete examples.

If we undertake to measure the extent of injury which the diphtheria toxin may produce we must carry our investigations into regions remote from the throat or other portal of entrance of the poison. We shall find evidences of its ravages in the general lymphatic glands, spleen, liver, kidneys, heart, peripheral nerves and central nervous system. In like manner if we trace the path of damage done by the typhoid fever poison we shall soon be led far beyond the confines of the intestine and of the other abdominal organs. In both of these instances, but especially in the first, there is reason to believe that the action of the poisonous agent endures for a period which lasts long after the producing agents—the bacteria—have been removed. But it is not necessary that the poisoning of the body be always evident,

as it is when the more virulent germs are present; it is probable that injury is also done to the tissues by milder, more transient and less patent parasitic micro-organisms.

When we come to consider which tissues suffer from the effects of the action of these poisonous bodies, we see that the damage, almost without exception, falls first and most severely upon the more highly differentiated, or as they have been denominated, the "nobler tissues." There is much evidence to show that differentiation of tissues takes place not without certain sacrifices, one of which is a diminution in the power to resist the action of injurious stimuli. But it cannot be said that differentiation alone can be made to account for the differences exhibited in respect to susceptibility to the action of poisons, for it sometimes happens that physiological activity or function, as we say, is largely responsible. The action of mercuric chloride and certain vegetable poisons (ricin) upon the epithelial cells of the intestinal mucosa is intimately associated with their capacity to cause the elimination of these bodies.

These considerations are more or less familiar in their application to pathological processes which take place in certain organs, *e. g.* the liver, kidneys and heart. It is one of the many excellent features of Dr. Van Gieson's recent Baltimore address that he attempted to show that in the central nervous system, and especially in the brain, the conditions of anatomical structures are similar to those found in the other organs just mentioned. From this very similarity in structure, it is reasonable to presume that the central nervous system is exposed to injury just as are the other active organs of the body. The brain is a compound organ, which is resolvable, as is the case of other organs, into two essentially different elements, a parenchyma and a supporting tissue. The parenchymatous elements are the nerve cells; the supporting substance or stroma, the neuroglia. The first represents the nobler portion; the second the humbler and subservient part. As a penalty for its high state of development the former has given up one of the most fundamental and essential properties of living matter, namely, the power of reproduction, a function still retained by the cells of the neuroglia. There is, therefore, no special "nerve pathology"; the brain is built up on the plan of the other complex organs; it is subject to the same general laws; it profits and suffers as do these organs.

Dr. Van Gieson drew interesting and important analogies between the kidney and the brain as regards their anatomical structure and the pathological changes occurring in them. He attempted to show how parenchyma and stroma suffer, and that the various pathological changes in each of the elements of both organs are analogous. As a matter of fact, however, the similarity of anatomical structure in these organs is apparent only and not real. We may speak of the "connective tissue" or stroma of the kidney; but the stroma or supporting framework of the brain is not connective tissue. The neuroglia has the same origin in the embryo as the nerve cells; both are derived from the epiblast, and at the time of the appearance of the earliest cells in the developing neural tube both structures have the same value. At a later period differentiation takes place, but the supporting framework (the stroma, the neuroglia of the brain and spinal cord) is an ectodermal and epithelial structure. In the kidney, of course, the stroma or framework is of mesodermal or "connective-tissue" origin.

That this difference in embryological and histological characteristics will determine differences in pathological behavior does not, nevertheless, follow. The analogy seems justifiable, and it is to be commended in so far as it carries the import put upon it by Dr. Van Gieson, namely, that in respect of reaction to insult, or in the development of disease, the central nervous system is not a separate entity with peculiar laws of its own, but is subject to the same conditions manifested by other organs within the body. Of course there is good reason to believe that the nerve cells are more susceptible to injury than the glia cells; and we know that the latter are capable of replacing considerable defects of brain substance.

The human organism is exposed to injury from without through the entrance of poisons or parasites capable of forming poisons; it is also exposed to injury from within through the action of causes bound up with disturbed metabolism brought about by perverted, excessive or insufficient function of certain important organs. These harmful substances act now upon one, now upon another, and now upon all the organs of the body. The injury inflicted is severe or slight, is capable of being recovered from or does permanent damage. An expression of

deleterious effects exerted upon the kidneys is seen in Bright's disease, upon the liver in cirrhosis, and upon the central nervous system in certain degenerative and productive lesions.

EXPERT TESTIMONY.—The perennial crop of bills intended to correct alleged evils in the procurement of medical expert evidence has been of unusual luxuriance during the past season. Minnesota and New York have proposed almost identical legislation. The bill provides for the appointment, by the presiding judge, of not more than three experts in any criminal trial in which expert evidence is demanded. The experts thus appointed are required to take a juror's oath that they have had no conversation or communication relating to the case with counsel on either side. They are subjected to examination after the manner of other witnesses, and their qualifications are to be determined by the court. An Illinois bill provides for the annual appointment of experts for all hypothetical questions in criminal trials. From the list of official experts—appointed like notaries public for the year—counsel may select at discretion. It is sincerely to be hoped that none of these bills will be enacted. The ills which all the proposed measures aim to remedy are outgrowths of original sin and, like the social evil, will never find a cure by legislation. Bias cannot be wholly eliminated from the witness-stand, be restrictions what they may. The occasional instances where expert evidence has been alleged to be purchased do not indicate prevailing practices and are exceptional. Such instances are exaggerated; it is unjust to condemn indiscriminately a class of physicians who are as a rule honest, scientific, and who cannot be biased by a money consideration. If disparaging lawyers and journalists who are prone in their self-righteousness to exclaim "stop thief!" would moderate that diverting vocal effort, or tarry in their pursuit of the proverbial mote long enough to remove the individual beam, they might profit perchance by the leisurely opportunity to gain a truer insight into the merits of the questions involved. But a still more deplorable feature of the discussion of this issue is the readiness of the medical profession to decry its members who have the misfortune to appear on the witness-stand; forgetting, as they do, the diversity of opinion that frequently exists in respect to many obscure problems of medical science.

The plea of insanity as a defence for crime originates invariably with counsel. If the instances were known—and they are by no means rare—in which the expert has quashed the plea by outspoken advice, and at the sacrifice of a fee, it would astonish a public that has been too ready to condemn. The bare fact that scientific men are opposed to each other in a court of law is sufficient to lead to contumely and the insinuation that medical opinion is biased by a material consideration. The cases for which expert evidence is sought are usually obscure. There may be, and there usually is, sufficient ground for a difference of opinion, especially when hypotheses have been skillfully embroidered on a flimsy texture of fact until white becomes black in the typical hypothetical question. Upon abstract questions of science experts do not, as a rule, disagree. Scientific opinions are far more consistent than the judgments of courts, as is well illustrated by the large proportion of reversals handed down from courts of last resort. If legal experts disagree upon questions which have vast precedent and rulings, in many if not all of their phases, is it surprising that alienists should differ in respect to the workings of the mind organ with its kaleidoscopic manifestations? It may be that experts permit a partisan sympathy to carry them beyond a prudent neutrality, but fortunately human nature is not reversed in a physician, and his client, like his patient, receives his sympathies, which is surely permissible, if not praiseworthy, so long as he confines his evidence to strictly scientific truth. There is a manifest difference between an expert witness and a commission or referee. The position of the expert is not judicial, and the counsel consulting him very naturally extracts from him those scientific statements which favor his client, but in this manner only is he the counsel's ally. Such practice does not imply dishonesty. Nevertheless it is made to appear so whenever possible by opposing counsel, and thus lends color to the standing accusation.

The only remedy for partisan expert evidence is the medical commission. No statutory device within constitutional limits can prevent counsel from nullifying any provision that can come within the practice of American courts; and any court witness, however neutral may be his appointment, who is subjected to cross-examination will lose his identity as such in the estimation

of the ordinary jury. His evidence to be of any value must be either *pro* or *con* in its conclusions, and in either case he will be put upon the defensive by the cross-examination. His status will then be precisely that of the expert witness under the present practice.

A medical commission as a referee, with the court's prerogative, whose findings will be subject to review and appeal, might come within constitutional restrictions. There is apparently no other way of modifying present alleged abuses, except to adopt the suggestion of Dr. Ransom of New York that the initial legislation be confined to a statutory definition of the qualifications of an expert, or to have his qualifications passed upon by some representative body of his own profession. With this as a first and experimental chapter, an evolution of practice and sentiment might gradually lead to the correction of this over-estimated evil.

FIFTY-FOURTH ANNUAL MEETING.—The fifty-fourth annual meeting of the American Medico-Psychological Association will be held in St. Louis, Mo., commencing May 10th, 1898, and continuing until May 13th, 1898, inclusive. Arrangements have been made by the committee of arrangements for the accommodation of members at the Southern Hotel, where all meetings of the Association will be held.

THE ENOCH PRATT BEQUEST TO THE SHEPPARD ASYLUM.—On the twenty-fourth of February the House of Delegates, of the Maryland General Assembly, passed by a vote of sixty-five to twenty the bill which had nearly a month previously been unanimously passed by the Senate, changing the corporate name of "The Trustees of the Sheppard Asylum" to "The Trustees of the Sheppard and Enoch Pratt Hospital." This change was necessary in order to comply with the terms of the will of the late Enoch Pratt, of Baltimore, who made "The Trustees of the Sheppard Asylum" his residuary legatee upon the condition that the Trustees adopt the name and title of "The Trustees of the Sheppard and Enoch Pratt Hospital," and at the first session of the General Assembly of the State of Maryland obtain the passage of an act authorizing such change.

The estate which as a consequence of this change will be placed at the disposal of the institution amounts to about one million and a quarter dollars. From the income of this, according to the directions of the donor, the present buildings and grounds are to be completed, additional buildings are to be erected for at least two hundred more patients, and after that the income is to be mainly devoted to the care of the indigent insane, "in the most advisable manner, at very low charges or absolutely free," as may be deemed best in the judgment of the Trustees.

There was much opposition to legislative sanction to the change of name, most of which proceeded from interested parties who would have received the residuary estate had the Legislature refused to sanction the change. It is certainly to the credit of the members of the General Assembly of Maryland that, in the face of a powerful and influential lobby, backed it is reported by promises of liberal rewards to those who should vote against the measure legalizing the change of name, the bill was passed by such a large majority vote.

The lay and medical press of Maryland were practically united in favor of the measure, and the leading men of the profession were its active friends.

The Trustees have not yet outlined any plan of work, and as they made most careful and wise selection of plans for the buildings now in use, it is to be presumed that equal care and wisdom will be exercised in preparing for their completion and the erection of additional structures. It is to be hoped that they will not act hastily, as the profession looks to them to embody in their plans the latest and best thought in construction and organization.

The State of Maryland is to be congratulated upon the prospect of such excellent facilities for the care of a large number of the indigent insane. The State is sadly in need of them, notwithstanding recent optimistic statements regarding the care of her insane.

DEATH OF DR. RINGROSE ATKINS.—Irish mental medicine has lost an enlightened exponent in the death of Dr. Ringrose Atkins, Medical Superintendent of the District Asylum, Waterford. The deceased alienist succumbed on February 4th to suppurative appendicitis at the comparatively early age of forty-seven. Dr.

Atkins had a brilliant career in arts and medicine in the Queen's University, Ireland. His asylum experience began in the Cork Asylum as assistant medical officer. He was a most industrious writer on topics relating to the science and art of psychiatry, as all readers of the *Journal of Mental Science* know. He also contributed frequently to the *Dublin Journal of Medical Science*, of which he was an associate editor. He was a man of many amiable qualities.

AFTER-CARE OF THE NECESSITOUS INSANE.—The importance of helping indigent patients who recover from insanity to get started in life again is little appreciated by the public in this country, and there is a distinct call for earnest effort in this direction if we would meet a demand in which humanity, justice and economy alike unite. This demand, which is only beginning to be felt in the newer conditions of our country, has been recognized and nobly acted upon in European countries for a long time past with most beneficent results.

The earliest impetus in this work came from those engaged in the care of the insane, whose experience showed them how great were the difficulties to be met by cured insane persons in regaining a foothold in the world upon leaving an asylum. The first after-care society was originated at Eberbach in the Duchy of Nassau, by Lindpainter, the director, in 1829. Two famous French alienists and writers upon insanity in the early 40's also founded societies for after-care—Baillarger in 1841 and J. P. Falret in 1843. These two societies were consolidated in '48 and for fifty years have continued in increasingly humane activity, and in Switzerland, England, Italy, Germany, this work has long been earnestly prosecuted by enlightened benevolence. What we have learned in the beginning of our inquiry goes to show that the United States (and we must add Canada) do not compare favorably in these matters with European countries.

How worthy an object is this of helping the needy patient recovered from insanity! Convalescent homes for patients from general hospitals are springing up increasingly in our communities and their need is well recognized; yet if destitute convalecents from bodily diseases need after-care, even more do those from mental disease, because there is no malady from which

recovery is in every sense more difficult than from insanity. The patient of small resources who has been insane has generally lost or exhausted all his means, and months, sometimes years, have passed during which he has produced nothing for himself or family. If he is without family he has no place or person to depend on, and if he has a family he is either adding to their burdens and their misery if they receive him; or if, as in many cases, he is repudiated by his own nearest of kin he is still more wretched. The prejudice against one who has been insane may be ignorant and foolish, and indeed it is actually so in most cases, but it is nevertheless distinctly to be reckoned with. It leads to a general "passing by on the other side," and the foes of the insane convalescent in many cases are "they of his own household." Thus lack of employment, shelter, food, raiment, but, above all, lack of friends are encountered, and exposure to the elements, to temptations, to vice and idleness again and again bring about a relapse and the last estate of the patient is worse than the first. Not only is the principle on which the convalescent home is founded here applicable, but another recognized and established form of benevolence—that on which the prisoners' aid societies are based—is equally fitting of application, for there is just as rooted a prejudice, though of a different sort, against harboring or giving employment to the person who has been insane as there is against the ex-convict. Furthermore, the discharged prisoner is almost invariably given by the State at least a suit of clothes and a fair sum of money, while the patient recovered from insanity generally gets neither the one nor the other. Finally, if all other conditions were favorable, the ex-inmate of the insane hospital, though perfectly recovered, has before him all the difficulties incident to making a new start in life.

A renowned French alienist and humanitarian, Dr. Giraud, as quoted by Dr. Hack Tuke in a paper read in '94 before the London After-care Association, states that he considers the fundamental principle of after-care to be the following: "Society has not fulfilled its duties to the insane when it has helped them to be provided for and treated in asylums, if in their discharge it leaves them without support, without resources, and exposes them to causes of relapse. This is an omission not only from a

humanitarian but from an economic point of view." To supply this omission is the object of the various societies for after-care.

It may be useful to give a very brief review of what has been done in other countries in this direction.¹

The French "*Société de Patronage des aliénés guéris*," which is the outgrowth of a consolidation in 1848 of two societies founded in 1841 and 1843 respectively by two famous alienists, who were also renowned philanthropists, Drs. Baillarger and J. P. Falret, has for fifty years maintained an increasingly beneficent activity. Quite full details of its operation can be found in the *JOURNAL OF INSANITY* for July, 1894. In the year '91, 1504 persons, men, women and children, were entertained at Sunday reunions and dinners, 646 were aided in their homes, and 51 persons were secured positions. About forty patients are constantly kept at the Home of the Society, many of whom are usefully employed in simple forms of shopwork or trades, but no one patient remains more than two months. About \$7000 were expended in the work during this year.

In Switzerland there are nine aid societies for the insane; the oldest, founded in St. Gall in 1866, has two thousand members. The most recent one was founded in 1886. One of the best of these organizations was established at Zürich in 1875. From the reports of this Society a thorough system of co-operation of the people is apparent. The first invitation to membership in the Zürich Society, issued in 1876, reads thus: "In the knowledge that a rational and truly successful care of the insane is only possible when the efforts of the State find active assistance from the people . . . the undersigned invite the favor of the inhabitants of this Canton. The society to be formed proposes the task of protecting from relapse the needy patients discharged from the asylums, by means of material and moral support. The convalescent from insanity comes out into the world very often impoverished, helpless, alone, and alas! from the still existing prejudice, without prospect of support." One can see in studying the working of this Zürich Society that along with the en-

¹ These details have been gleaned from Tuke's paper above-mentioned and the description of the work of the French society by Dr. Victor Parant in this *Journal* in July, 1894; also from an account of one of the Swiss societies obtained by Dr. Adolf Meyer.

lightened humanity of the movement there is a practical economic sense, and that the good business man and the good Samaritan are united in the work. Experience with these helpless people has shown its necessity.

In Italy there is an after-care society at Milan, which owns a house and garden; and Turin and Reggio-Emilae have each after-care societies. Prof. Andre Verga was mainly instrumental in founding the Milan society.

Germany and Austria have after-care societies, the best organized of which is that of the Grand Duchy of Hesse, founded in 1874.

Last but far from least is the London After-care Association. Its title is "The After-care Association for Poor Persons discharged recovered from Asylums for the Insane." It was founded in 1879. Its secretary is H. Thornhill Roxby, Esq., whose address is Church House, Deans Yard, Westminster, S. W. This society does its work in three different ways:

I. By obtaining, when needful, an interval of change of scene and air.

(a) By placing in a convalescent home.

(b) By boarding in the country.

II. By giving grants of money and clothing.

III. By assisting to obtain employment.

It has an annual income of about \$3000 in donations, subscriptions and bequests. After reading the reports of work done it is difficult to conceive how larger good could be accomplished with smaller means.

Time and space are lacking for further details. It is hoped the above will aid in quickening interest in this work with readers of the JOURNAL. The task is before us of informing and interesting the public in the after-care of the cured insane. A beginning has been made. In our last issue¹ we presented some account of the admirable work done, mainly by Dr. Henry R. Stedman as chairman of the committee of the American Neurological Association in gaining the important consideration and endorsement of this body for after-care, and we published the conclusions of Dr. Stedman's committee as to kind and extent

¹*Am. Jour. Insanity*, January, 1898, p. 456.

of work to be done. At the meeting in New York this year (May 18-26) of the National Conference of Charities a sectional meeting of the committee on insanity is to be given to this subject. The work thus far done warrants us in saying that the cause at that time will receive substantial help.

THE PROGRESS AND PROMISE OF PSYCHIATRY IN AMERICA.—During the past few years psychiatry has furnished gratifying tokens of progress along scientific lines. One need not now debate the question that erstwhile vexed the *amour propre* of our neurological brethren, namely, to what extent alone intrinsic influences have aroused and stimulated consciousness of the rich harvests that await him who would intelligently and patiently till a fertile soil. The reader of the Summary knows that there has been advance everywhere, and for him to mark a fresh starting-point were indeed difficult, while to single out one State for special commendation would seem invidious. The Journal's purpose, however, is less to commend than to illustrate and incidentally to insist, by way of warning, upon the adoption of certain broad principles of conduct in this era of new and great things. If in the exuberance of youth we, as one of the more vigorous nations of the earth, vaunt ourselves upon our strength, we must take heed that "the brawn of Hercules" and a "martial thigh" lead us not into the temptation to trip too lightly the "foot mercurial," which alas! but too often has shown itself as a cloven hoof to more conservative peoples. Happily there is not wanting the evidence that that temptation has been successfully withstood in the evolution of the Pathological Institute of the New York State Hospitals. This centre for scientific investigation has existed two years, during which time it has been largely occupied in taking soundings, using its sextant and proceeding otherwise cautiously before spreading full canvas and away. Quite recently Dr. Clouston has expressed his belief that we are on the eve of an enormous extension of our definite knowledge in regard to the relationship of mind and brain. "Great, perhaps startling, generalisations on the subject seem to loom in the air; and until the man appears who will be able to shed the light of a great law on this, the most difficult of all scientific problems, we must be careful about accepting the conclusions of

those who generalize on imperfect data." New York may well vie with Scotland in hastening slowly in this matter. Indeed, New York may perhaps presume to give even Scotland the benefit of an instructive experience. The Pathological Institute is a distinct departure from the beaten track in so far as it is a protest against the precedent of confining investigation and research work in the life history of insanity, by the exact sciences, to exclusive work in the asylum itself by the microscope. It provides for an expansion of the entire field of study along comprehensive lines—the only way, it would seem, that furnishes solid ground for solid advance. This modern conception of the conditions that confront the scientist suggested a division of work into the subdepartments of physiological psychology; anthropology; cellular biology or cytology; pathological anatomy in its broadest sense, comprising not only work in the general pathological anatomy of the body at large, but also quite naturally in the specialized pathological anatomy of the nervous system; normal anatomy of the nervous system; physiological chemistry; bacteriology; experimental pathology; comparative neurology. The value of focusing these several departments of science upon the problems of insanity is obvious. Our only wonder is that we should have waited until this late day to elucidate and expand the largest problem in the universe instead of housing it up within asylum walls.

Particular stress, however, may be laid upon the imperative necessity for extending psychological investigations into the field of psychiatry and infusing new blood into a science which here and there shows traces of anæmia. Psychiatry, unfortunately, having no distinct and individualized methods of its own, has flapped about and drifted in the doldrums without gaining the new facts, phenomena and observations that are near and yet so far, and its legitimate property withal. These are wanted nowadays in psychiatry, instead of theories and hypotheses, which all too often are evolved out of the inner consciousness and which give rise to nothing more valuable than endless speculation.

"Ein Kerl der speculirt
Ist wie ein Thier auf duerrer Heide,
Von einem boesen Geist im Kreis umhergefuehrt,
Und rings umher liegt schoene gruene Weide."

But psychiatry can gather none of these facts and phenomena for which it is necessary to build up doctrines unless it has definite methods of investigation. These, therefore, it must borrow from other sciences, and most of all from modern objective psychology of the present time. Still another cardinal point of importance is the design of the Institute to bridge over the artificial hiatus between nervous and mental diseases, however much the distinction between the two may be of practical importance. No distinction between them from a scientific standpoint is of any use whatsoever, but on the contrary injurious, and has contributed not a little to retarding the progress of the pathogenesis of both sets of diseases, more particularly the mental group. For this reason we are gratified to note that the Institute has declared its purpose to go on with the re-investigation of nervous diseases, which the modern advances of the day in cytology and morphology of the ganglion cell demand. Such an institution must have ample time to grow and develop; it cannot be created by fiat and put forth startling scientific discoveries the moment it is born. Let ample time be given for organization of its departments, let responsible men be placed at the head of each, and then let them elaborate and concert their plan of scientific action.

We are gratified to know that already in the comparatively brief period of two years the Pathological Institute of the New York State Hospitals is ready to publish some of the results of this departure from conventional methods of inquiry. We feared that the expectancy of epoch-marking results by those who are not equipped to understand in detail how complicated the technical methods of these various branches have grown, and how deliberate, patient, cautious and extensive this kind of work must be, might prove a tedious obstacle to the establishment of similar institutions in other States.

In Massachusetts the advance research is already well along. Under Dr. Cowles' stimulus at McLean Hospital, Kraepelin's pioneer work in resurrecting psychiatry by the vivifying touch of psychological methods of investigation maps out the trend of clinical studies, and cellular biology, in the hands of Dr. Hoch and his associates, is forming the substratum of pathological inquiry. At Worcester also, under the guidance of Dr. Meyer, scientific investigation of the insane has broadened out, especially

along the advance lines of cytology of the neuron, while at Danvers it appears that the great field of the powerful Golgi-method type of research is being carefully garnered.

There is much to be said in favor of the location of such an institution in the metropolitan centre of a State, where it may come in contact with extrinsic phases in the development of the life history of insanity, and not within one of the hospitals, where its opportunities in such a direction would be restricted. In good season it may reach out among the internes and physicians for active workers, but before this can be done there must be given time for development. The profession generally should guard itself against the thought that the men in the hospitals can immediately plunge into the intricacies of technical methods of investigation, much less interpret their results, simply because a pathological institute has been inaugurated containing a staff of investigators who have devoted years of training to gain these capacities. But it should be the design of the Institute to provide instruction to hospital men, who should be stimulated to choose wisely in the prosecution of research work and guided in their operations by trained specialists; it may be in the comparative biology of the nervous system; it may be in some neurological field; it may be along psychological lines of investigation; it may be in physiological chemistry, etc.; or it may be with reference to the effects upon the nervous system of a general somatic disease of every-day occurrence, which, by the way, should be investigated by those who would seek further progress in the pathogenesis of mental diseases. Here we have an excellent illustration of the great advantage of broadening out the scientific investigation of the insane and bringing it into touch with the extrinsic phases of insanity. As physiologically and morphologically all development is a progress from the general to the special, so in the evolution of this great auxiliary department of psychiatry, in New York and elsewhere, must one be careful to build upon a sure foundation and not run riot in specialization before that prerequisite of safety is an accomplished fact of construction. Then may we have the satisfaction of realizing that "the crescent promise of our spirit hath not set."

Obituary

EDWARD CONSTANT SEGUIN, M. D.

NEW YORK.

Dr. E. C. Seguin, at one time one of the best known of American neurologists, died at his home in this city, on February 19th, 1898, of a chronic affection of the liver. Dr. Seguin was born in Paris fifty-five years ago, but was brought to this country by his father, Dr. Edward Seguin, when he was seven years old. He was a brilliant student, and was graduated from the College of Physicians and Surgeons in this city, at the early age of twenty-one years, after having already served two years as medical cadet in the regular army. After the war he was stationed as post surgeon at different forts in New Mexico. Afterward he resigned from the army and went to Paris to study in the clinics of Charcot and other neurologists. He returned to this country in 1870 or 1871, and at once began the practice of medicine in New York City. For nearly fifteen years he was a member of the faculty of the College of Physicians and Surgeons, and was also actively engaged in neurological practice and in editorial and other literary work. His health had been poor for some time before his death and he had lived in practical retirement for several years. He was an honorary member of many neurological societies in Europe.

WILLIAM P. JONES, M. D.

Dr. W. P. Jones, a resident of Nashville, Tenn., for fifty years but a native of Kentucky, died at his home, September 25, 1897, at the age of 78 years. He had filled many public offices and was president of the Medical Department of the University of Tennessee. He was superintendent of the Central Hospital for the Insane at Nashville from 1862 until 1870, being the immediate predecessor of the late Dr. Callender. He was a member of the American Medico-Psychological Association.

Book Reviews

The Psychical Correlation of Religious Emotion and Sexual Desire. JAMES WEIR, JR., M. D. Courier-Journal Job Printing Co., 1897. 338 pp.

This book will be somewhat of a disappointment to the seeker after pornographic literature, since it is really not as bad as the title would seem to suggest. The first hundred pages are devoted to the consideration of Religion and Lust, and the author's first proposition is that the idea of the supernatural was primarily derived from external phenomena. He then discusses the subject of Phallic worship, and concludes this part of the volume with a discussion of the relationship which he supposes to exist between religious feeling and sexual desire. The physiological explanation, namely, that all emotional states are in a sense correlated, does not seem to have occurred to him. The line of argument is unscientific and the illustrations are drawn in large part from old books of travel. Much time and labor have evidently been expended exploring the musty, dusty, dirty pages of ancient literature without educing proofs strong enough to warrant the conclusions arrived at, and it is to be regretted that this energy was not directed to some more useful theme. It is perhaps true that at one time in the world's history the organs of generation were objects of veneration, but at the present day the temples of Venus are under police surveillance. The remainder of this volume is devoted to a number of short, incomplete and dull articles upon such hackneyed themes as hypnotism, genius and degeneration, suicide, etc. The author is perhaps to be congratulated on the fact that religion and lust did not pursue each other through the whole book. G. J. P.

The Psychology of Suggestion. By BORIS SIDIS, M. A., Ph. D., Associate in Psychology at the Pathologic Institute of the New York State Hospitals, with an Introduction by PROF. WM. JAMES, of Harvard University. D. Appleton & Co., New York, 1898.

"By suggestion is meant the intrusion into the mind of an idea, met with more or less opposition by the person; accepted uncritically at last; and realized unreflectively, almost automatically." After such a definition one may well be apprehensive as to the remainder of the book. Suggestion the author confines, in spite of the above specifications, to the "subconscious self." He explains it by "disaggregation," as due to a "split" or "cleft" between the "upper" and "lower" self. Neurologically this "disaggregation" is the result of retraction of the cell dendrons. In normal suggestion the retraction is slight. In hypnosis it is abnormal, and the depth of the hypnosis is proportional to its completeness. In

criticism we may remark that the difficulty with such a theory lies in imagining how disaggregation and retraction among the cells generally, as described by the author (p. 212), can explain the sharp horizontal cleft between an upper and a lower self which he, throughout, conceives. To think of the hypnotic self as a *reduced* self may well be possible. But a treatise of "suggestion" outlined on the assumption of "disaggregation," and filled in copiously with hair-standing selections from modern French hypnotic clinics, is, we fear, less available to the sober student of this perplexing subject than pure blank paper.

In support of his theory the author presents many "experimental investigations." All laboratory men of the exact science must read these with sorrow—or the extreme contrary. In his preface the author declares that "it were well if the French were to conduct their investigations with German thoroughness." Yet in spite of this it would seem that the author himself clearly belongs to the French school.

Part II of the book treats of The Self; and here is outlined a new system of psychology and of metaphysics, with great satisfaction, it would appear, to the author. Part III carries "suggestion" into society. The following quotation fairly suggests its value and the general style of the book throughout: "When, however, it [normal suggestibility] rises to the surface and with the savage fury of a hurricane cripples and maims on its way everything it cannot destroy, menaces life, and throws social order into the wildest confusion possible, we put it down as mobs. We do not in the least suspect that the awful, destructive, automatic spirit of the mob moves in the bosom of the peaceful crowd, reposes in the heart of the law-abiding citizen. We do not suspect that the spirit of suggestibility lies hidden even in the best of men."

In a word the book is not sound. It would not merit the consideration of this Journal were it not typical of the literature that is flooding this particular field, and did it not bear upon the title-page apparently official endorsement from a high quarter. This latter, however, is easily to be understood by any one familiar with the ever-flowing tenderness and generosity of him who has lent his famous reputation to the Introduction.

Hypnotism is a rich field, fairly crying out for reliable investigation. When will the right man come!

Jamaica. Annual Report on the Lunatic Asylum for the Year ended 31st March, 1897. J. W. PLAXTON, M. D., Medical Superintendent.

At the end of the year the Jamaica Asylum contained 722 patients, an increase of 58 over the number remaining at the end of the preceding year. The report shows that this number is straining the capacity of the asylum to the utmost. The report shows a very low death rate (4.93 per cent.), the lowest in the history of the asylum, due to an entire absence of deaths from diarrhoea and dysentery—"a circumstance probably unique in the history of a tropical asylum." Of the deaths, however, 36 per cent. were due to pulmonary disease, and Dr. Plaxton urges the necessity of

isolation wards for cases of tuberculosis. The report is a brief synopsis of the work of the year, and as such does not differ from other asylum reports. There seems some need of legislation, especially as regards the restriction of marriages among degenerates, and this point comes with fresh emphasis, following the removal from the asylum during the year, against the advice of the superintendent, of a patient for the purpose of permitting a contract of marriage. The patient was not long after returned to the asylum, the parent of a child.

Zeitschrift für Criminal-Anthropologie, Gefängniswissenschaft und Prostitutionswesen. Edited by WALTER WENGE, Dr. Med. and Phil., and many other collaborators. Published by M. Priber, Berlin, 1897.

No. I.

1st. Lombroso and Criminal Anthropology of to-day. By Dr. Paul Näcke.

2nd. Crime and Mental Disease. By Dr. Rudolph Arndt.

3rd. The Handwriting of Criminals. By Dr. W. Preyer.

4th. A Study of the Bibliography on Prostitution for the Year 1896. By Dr. Münchheimer.

5th. An Inquiry into Suicide. By Dr. Lauptz.

6th. A Report of the 4th International Congress of Criminal Anthropology held at Geneva. By Dr. Paul Näcke.

I.—Näcke in his paper severely criticises certain of Lombroso's theories in relation to criminals, and shows how much of Lombroso's work is of a superficial character and lacking in careful scientific investigation. The modern trend of thought among the best informed students of criminology in Germany, France and England is opposed to the ideas of Lombroso, who maintains, broadly speaking, that the criminal belongs to a distinct anatomical and physiological type of man, that he presents a type of atavism, that he is born a criminal, not made one by external conditions. Those opposed to Lombroso feel that it is not possible to classify criminals in this manner, that Lombroso has gone too far, and that more weight must be given to the consideration of external factors in the production of the criminal class. The difficult question of "moral insanity" and its relation to crime is taken up, and Näcke shows that Lombroso has no clear idea of the true meaning of "moral insanity." It appears from this paper that Lombroso is coming to hold a more and more lonely position in the study of criminology, and that he bitterly attacks all students, including Virchow, who hold different ideas from his, and accuses them all of ignorance and of not carefully studying his own works. Näcke concludes his paper with the four following propositions, to which the best criminal anthropologists conform: *a*, all so-called signs of degeneration are found more commonly among criminals than among other men; *b*, along with the individual factor in producing a criminal, the social is also very important, which some students, certainly falsely, attempt to make alone responsible; *c*, among criminals are

included many insane, weak-minded, and "minderwertige," who are improperly thus classified; *d*, most of the so-called signs of degeneration belong to the realm of pathology, and may point to an abnormally acting brain, but cannot be said to be a proof of criminality.

II.—Arndt discusses the relationship of crime to mental disease, and relates the history of an interesting case. He first explains how the recognition of a man with mental trouble is to be made, and enters fully upon variations of character and deed of the individual affected. He shows that much confusion has arisen, due to the different views held by doctors, courts, and the laity, thus making it most difficult at times to decide whether an individual is or is not mentally diseased. He remarks that as there is "no absolute Ego, so there can be no exact mental disease" ("wie es kein unbedingtes, kein absolutes Ich giebt, so es auch keine Krankheiten desselben an sich, mithin keine Geisteskrankheiten an und für sich, geben kann"); and "mental disease is only the morbid expression of a diseased Ego" and that "a marked change of character is the surest proof of a disease of the mind."

III.—Preyer, who has devoted much study to this question, believes that the importance of the subject has not been sufficiently recognized, and that much more attention should be given it; that collections of handwritings of criminals should be made and carefully analyzed. He believes moral defects in the character of unknown persons can be diagnosticated from their handwriting, and that the graphological examination may in certain cases be of the utmost importance in the imposition of punishment. He concludes his paper, which is simply a plea for more extensive investigations into this subject, with the following sentence: "The excess in the nature of violent, raging, immoderately passionate man is accurately portrayed in his handwriting, whether he be a criminal or not."

V.—Lauppts reports briefly two cases of attempted suicide, for which there were no causes apparently sufficient to explain the desires of the individuals to take their life. It would appear in both instances as though the men had been influenced merely by a kind of "biophobia." These cases are reported simply to elucidate the etiology of suicide in certain instances.

No. II.

1st. The Rational Treatment of Criminals. By Dr. Penta.

2nd. On Identification. By Dr. Paul.

3rd. Problems in Homo-sexuality. By Dr. Moll.

I.—All the improvements that Penta pleads for would be readily subscribed to by those who have the welfare of the criminal classes at heart. His paper discloses a most atrocious condition of the prisons, and criminals shut up therein, in Naples, and we suppose that the same horrible treatment exists in other parts of Italy. The changes which Penta advocates are already generally adopted in Germany, France, England, and the United States, where in all these countries, although there is much

room for improvement, yet no such 'crimes against criminals' are practiced as in Italy. The paper is rational and moderate in the reforms advocated, which certainly ought to be introduced into Italy without delay. Although the author deals only with Italian prisons, yet his suggestions are worthy of study by all men in control of large reformatories.

III.—Moll discusses this subject at length, both as it relates to man and woman. He considers it first from a physiological standpoint, and shows that the same conditions exist in animals, and also that it has existed at all times. He next takes up the question as to whether homo-sexuality is a congenital or acquired faculty, and shows that it should properly be considered as acquired; that hetero-sexuality is the true congenital condition, that homo-sexuality is a somatic rather than a psychic quality. The next point he considers is the position of homo-sexuality in pathology, and the influence of heredity on individuals given over to this form of vice; he believes homo-sexuality to be a true pathological condition, but does not thereby mean to imply that persons practicing it are to be considered irresponsible. The relation of homo-sexuality to psychic degenerations is next made clear, and the author shows that although this subject has not been much studied, a certain relationship does exist. Many mistakes, he says, have been made from confounding homo-sexuality in men with male prostitution, and that these two conditions should be separated. Homo-sexuality in women has been less studied and the author has not added much on this point. In conclusion he speaks of what may be done to help these diseased individuals from a therapeutic standpoint, and thinks that in a certain, comparatively small, proportion much can be done, and that hypnotism is valuable, but that favorable surroundings and self-confidence of the patient are factors that are of importance also and should not be forgotten.

No. III.

1st. Crime and Criminal Statistics, with special reference to American Conditions. By Dr. Falkner.

2nd. New Studies in the Realm of Female Crime, Prostitution and Psychopathia. By Dr. Moraglia.

3rd. On Identification. II. By Dr. Paul.

4th. Crime in Spain. Professional Organization. I. By Dr. Salillas.

5th. Dr. Zakrewsky and his Relation to Criminal Anthropology. By Dr. Wenge.

I.—This is an interesting study of criminal statistics in America, compiled from the census reports. Dr. Falkner shows how hard it is to obtain reliable statistics, and how difficult to draw any correct conclusions from those we have. He explains in his paper how those occupied in getting figures on crime should prepare them for the next census. It is a valuable contribution to this question, and should be printed in some American journal, if it has not already appeared in one, in order that such persons as give especial study to this question may learn how reliable statistics on crime may be gathered. We cannot take the paper up

in detail, but the essential point seems to be that very careful tables should be drawn up distinguishing between major and minor crimes, and the exact number of days in jail for each, since statistics without such differentiation do not accurately represent the true amount of crime.

II.—Moraglia divides his subjects into two parts: 1st. Female Criminals and Prostitution; 2nd. Tribadism, Sapphism, and Sexual Perversion. The first half is a statistical study of the connection between women criminals and prostitution, with a brief report of a number of cases. He discusses this question from anatomical and physiological standpoints, and demonstrates what seems to him a very close relationship between crime and prostitution, especially in the physiological factor of menstruation, which he believes is apt to come on early in both female criminals and prostitutes. He also lays much stress on tattooing and onanism as important signs of degeneracy among criminals. Early menstruation and sexual desire, he shows, occur frequently in women who break their marriage vows, and to this class of criminals he devotes considerable attention. The first section of the article is supplied with numerous statistical tables, both of numbers of criminals and anatomical and physiological signs. Almost the entire second part of the paper is devoted to the relation of two cases, one of tribadism, the other of sexual perversion, and a discussion of the difference existing between these two classes of degenerates. To throw light on the mental condition of these two patients he gives numerous abstracts of letters written by them. The entire article is a serviceable addition to the study of crime among women.

NOS. IV AND V.

1st. Considerations of the Question of Sexual Perversion. By Dr. Laupts.

2nd. On Identification. III. By Dr. Paul.

3rd. Crime in Spain. II. By Dr. Salillas.

I.—Laupts first describes "sexual perversion" as an abnormal form of love which certain individuals feel for other members of the same sex to which they themselves belong, and then considers homo-sexuality, for which, he says, it does not seem logical to look for any one cause, since it is probably induced by different elements; this he demonstrates by describing several cases. He believes that there are two categories of homo-sexualists, and that there is the same difference between them as between murderers and delinquents; and with the French school, as opposed to Lombroso, believes that crime is a result of evil social conditions. In homo-sexuality he sees a pure lack of nervous development, which is not associated with any visible psychical signs. He enters into a very full description of the classification of homo-sexuality, giving Magnan's, Ball's and Lacassagne's tables, and then forms one of his own. He divides homo-sexuality into two main classes: 1st, the morbid ("krankhafte"), and in these cases we have to deal with instances of perversion; 2nd, the symptomatic, in which cases "perversity" is often a factor. He also gives Laupts' classification, which is the most complicated of

all. He concludes his paper with a brief historical review of homo-sexuality, and finally adds a letter of Lauppts, addressed to specialists on this subject, asking for information and answers to the questions enclosed, so that a more careful study can be made of the whole question. It is important that those who are studying "homo-sexuality" should refer to this letter, as they will thus learn all the points which should be taken into consideration in each case.

II.—Paul is an advocate of the Bertillon anthropometric system of classifying criminals, and in this and two preceding papers has reviewed the system at length, showing wherein it surpasses all others and how it can be improved. He pleads strongly for its more general use. His is a very clear resumé of the entire subject, and should be read carefully to be appreciated, since it is too long to do it justice in any brief review. In the final number he shows how far the system has been adopted in different countries and with what modifications.

III.—We are unable to abstract this and the former paper by Salillas in any satisfactory manner. They must be read from beginning to end to understand them satisfactorily, since the author's classification is peculiar, and the use of Spanish words of a technical order, for which there is no good English equivalent, renders it difficult to describe the existing conditions accurately. The article is full of minute detail, and seems to us more of interest from an historical rather than practical view. As a study of existing conditions it is a valuable contribution to the question of crime in different lands among different people.

Correspondence

BOARDING OUT THE INSANE IN MASSACHUSETTS.

LETTER FROM DR. MOULTON.

TO THE EDITOR OF THE AMERICAN JOURNAL OF INSANITY:

Since sending my last communication to the JOURNAL the annual report of the Massachusetts Board of Lunacy and Charity has been issued. The Board recommends "that all pauper insane persons now in city or town almshouses, or boarded in families by the Overseers of the Poor, be transferred as rapidly as circumstances will permit to the State institutions for the care of the insane, and to the care, custody and control of the Commonwealth." A provision follows for the support of such patients at a rate to the cities and towns less than the average cost to them under the present undesirable arrangements.

As there were 939 insane persons in almshouses on September 30, 1897, a majority of whom might be cared for in families, it is hoped this recommendation of the Board will be acted upon favorably. Then there would be material available for a *real* boarding-out system.

Very respectfully,

A. R. MOULTON.

LETTER FROM MR. F. B. SANBORN.

TO THE EDITOR OF THE AMERICAN JOURNAL OF INSANITY:

I can hardly say I was surprised at Dr. Moulton's comment on Sir Arthur Mitchell's admirable criticism of the half-hearted way in which the Lunacy Board of Massachusetts has administered and described the boarding-out system for the past ten years. He says "it was most unfair and misleading." By a singular coincidence, it was exactly in those terms that Sir Arthur and Mr. Spence, of the Scotch Board, mentioned to me Dr. Moulton's report of their system (published in 1892) when I visited Scotland for the second time, in 1893, to see that system for myself. I should have been more surprised if Dr. Moulton had accepted Sir Arthur's remarks in the spirit in which that experienced friend of the insane made them. But it does startle me a little to read Dr. M.'s explanation of the Massachusetts situation since 1888—so much is it at variance with facts easily accessible to him, even at the distance of Philadelphia. His long article in the Boston Medical and Surgical Journal, where Sir Arthur's paper appeared, and to which Dr. M. refers

your readers, is more "misleading" (to quote his own term), because more in detail, and neither of them shows the exact state of the case. In brief, he says that the number of State patients has so fallen off, and the city and town authorities are so bent on sending their patients to almshouses, that his successor, Dr. Woodbury, has been unable to find patients for boarding-out.

Now, in the reports of the Board whose officer Dr. Moulton was during 1890 and 1891, the number of the Massachusetts insane in almshouses and unsupervised families was given as 967, July 1, 1889, and 850 in 1890; and by the latest report the number, July 1, 1897, was less than 1,060. As the whole number of the city and town insane poor at that date is given as 5,003, while in 1889 it was but 3,492, it is evident that a much larger proportion of them were in almshouses at the first date than now, and that no very large number can have been withdrawn by the overseers of the poor and (as Dr. Moulton expresses himself) "landed in a wretched almshouse"—since in eight years the number outside the hospitals has increased but 100, or at the rate of 12 a year, while in the hospitals they have increased from 2,764 to 4,250, or 184 each year. During this period the town insane boarded in families under State supervision have increased from 50 in '89 to 69 in '97; while the State cases have fallen from 46 to 31.

Let us now look at the actual figures of boarding out from August, '85, to February, '98. Up to August 4, 1888, when the Lunacy Board, in whom Dr. M. "never saw evidence of enmity to the boarding-out system," put a stop to all boarding for months, I had personally placed in families 180 insane persons, or at the rate of 60 a year; up to the present date (February 21, 1898) only 450 have been so placed. Since I was stopped from continuing the work only 270 have been boarded out in 8½ years, at the rate of only 32 a year. And of those, about 170 were placed by Dr. Moulton in the two and two-thirds years that he held office as my successor. During the 6½ years since he resigned Dr. Woodbury, his successor, has boarded out but 100 persons (nominally 104), and those by years as follows: In '91-2, 47, 35 of whom were town patients; in '92-3, 20, 12 of them town patients; in '93-4, 14 (8 town patients); in '94-5, 11, unclassified; in '95-6, 8 (4 town patients); in '96-7, 4, of whom 2 were town patients. His yearly average has therefore been 16, against my 60 and Dr. Moulton's 64; and even that small average fell to 4 last year. If that is not growing "small by degrees and beautifully less," what would be?

Yet the stock to choose such patients from was constantly growing greater. In my three years the average of chronic patients committed in the whole State was 982; in Dr. Moulton's three years it was 1,183; in Dr. Woodbury's six years it has been 1,390. These figures may not be exact, but they were reported by Dr. Moulton and Dr. Woodbury, and as they proceed on the same basis from year to year, they are good for purposes of comparison; and they indicate that while I placed out one in 16 of the available patients, and Dr. Moulton one in 18, Dr. Wood-

bury has placed out only one in 43. This does not show that "Dr. Woodbury has labored hard to board out patients," unless there were "real enemies in the Board of Lunacy" against the system, which Dr. Moulton (from Philadelphia) denies to have been the fact. The figures given by him as remaining at the end of each year simply show that, while the number placed out since 1891 has been small and decreasing, the system has worked so well that those previously sent out remained in families.

In his Boston article Dr. Moulton makes two statements (the first cited with approval from Dr. Hildreth) which hardly look well when placed side by side. "Experience has shown that convalescent cases receive the most benefit from boarding out." "Patients whose disorder is acute are not legally permissible for boarding out." As "convalescent" usually means "recovering from an acute attack," it is hard to see how convalescents can be "chronic," except in those very few cases where recovery occurs after two years' treatment; in fact, among the 180 patients whom I placed out, not six could have been termed "convalescent"; and I doubt if the proportion has since been increased. If Dr. Woodbury or Dr. Hildreth will give exact figures we should soon see which class benefited most; but certainly the law, which I drew, only authorized (in 1885) the boarding of "insane persons of the chronic and quiet class" and (in 1886) "insane persons discharged without recovery" from hospitals and asylums. This same law of '86 made it impossible for overseers of the poor to withdraw their patients from hospitals without the consent of the hospital, and it is still in force. Those who have been thus withdrawn were mostly discharged because they were considered incurable and because their places were needed in the constant overcrowding of our establishments for recent cases. Instead of being sent "to wretched almshouses" they either went to the care of their friends or (generally) to fairly good local asylums, most of which are better places for them than the State hospitals were 30 years ago.

I am glad that Dr. Moulton sees an unfitness in almshouses for good boarding-out patients; it was not always thus. The Board which appointed him had just before caused the removal to an almshouse ward of nearly forty patients who had been living comfortably in families; there they sat idle for months, and must have been seen by him in his monthly visits, yet I never heard that he took any pains to remove them. Five more patients were living, when he took office, in the best boarding place for that class I ever saw; he joined in the (illegal) attempt of his Board to send these women back to the almshouse; and when Miss Cooke refused to consent to that, as she had done before, and her county judge put three of them under her legal guardianship, Dr. Moulton reported to the enemies of boarding-out in his Board (there *were* such then, to my certain knowledge), "that said persons are each and all restrained of their liberty by reason of alleged insanity by said Cooke." The fact was, and Dr. Moulton knew it well, that they *were* insane, were perfectly well treated, and would not leave Miss Cooke's kindly care to go to any

hospital, much less to an almshouse. Yet he joined with the persecutors of this good woman, and consented to the meanness of depriving her of the petty stipend the State had agreed to pay, because she would not be a party to their illegal removal to an almshouse. And when she applied for the customary license to keep a private asylum (which was granted her years afterwards), I do not find that Dr. Moulton tried to remove the hostility of the Board, whose self-love she had wounded by her fidelity to her patients. He also joined with them in their advocacy of the costly and otherwise objectionable chronic asylum at Medfield.

Concord, Feb. 22, 1898.

F. B. SANBORN.

RUSH MONUMENT COMMITTEE.

SYKESVILLE, March 25, 1898.

TO THE EDITOR :

The following subscriptions to the Rush Monument Fund have been received from members of the American Medico-Psychological Association since the appointment of the Committee of the Association, May, 1897 :

1897.

July 1.—From Dr. G. Alder Blumer, Utica, N. Y. . .	\$5 00
Sep. 13.—From Dr. D. R. Burrell, Canandaigua, N.Y. . .	5 00

1898.

Mar. 11.—From Dr. Gershom H. Hill, Independence, Ia. . .	10 00
“ From Dr. F. C. Hoyt, Clarinda, Ia.	5 00
“ From Dr. C. S. Applegate, Clarinda, Ia. . . .	2 00
“ From Dr. Anna Burnett, Clarinda, Ia. . . .	2 00
“ From Dr. A. T. Gundry, Clarinda, Ia. . . .	1 00
“ From Dr. H. A. Gilman, Mt. Pleasant, Ia. . .	5 00

\$35 00

GEORGE H. ROHÉ,

Chairman Committee.

LETTER FROM DR. WOODBURY.

TO THE EDITOR OF THE JOURNAL OF INSANITY:

Extracts from an address by Mr. F. B. Sanborn before the Legislative Committee of Massachusetts concerning the care given the insane, their increase in numbers, the recoveries resulting, and the increase in insane paupers, with the merits and demerits of these subjects from the speaker's standpoint, have appeared in several public prints, and to any one not fully cognizant of the conditions in the State are misleading.

His assumption that the increase of insane, or, as he neatly puts it, of the *visible insane*, since 1868, is largely due to “the aggregation of the insane in masses,” which has not only failed to check their increase

but has greatly promoted it, is quite an individual opinion; also that to the same cause is due the fact that within the last thirty years the insane have trebled in number while the population of the State has only doubled, and that the policy followed by the State has diminished recoveries.

If we accept such statements as these we must acknowledge that all the earnest and unselfish devotion of those in charge of hospitals, the scientific research and treatment, which have been especially marked in the last decade, have amounted to nothing, and that these specialists have not only failed to keep up with other branches of our profession, but have retrograded, seriously and culpably.

Has there been any increase in the number of insane in this State? and, if so, to what extent? What is the apparent, and what the real increase? The following table shows that there has been an increase, but with diminishing ratio:

	Aggregate Population.	Visible Insane.	
		Whole No.	No. per 1000.
Sept. 30, 1870	1,457,353	2190	1.5
" 1875	1,651,902	2606	1.57
" 1880	1,783,086	3724	2.09
" 1885	1,941,465	4543	2.34
" 1890	2,238,943	5700	2.54
" 1895	2,500,183	6768	2.71

The apparent percentage of insane in 1870 is small, too small. The data furnished at that time are not so complete as in later years, owing to imperfect returns from towns. A constant pressure has been made in the past thirty years upon town officials to insure thoroughness and care, and now these returns, supplemented by reports of visitation of almshouses and private families, are giving much more reliable statistics than could be obtained in former years. In addition to this, our knowledge of the actual number of the insane in the State has recently been made still more complete by investigations made by a physician skilled in the diagnosis and treatment of insanity, who personally visited and examined all inmates of almshouses and boarders in private families, to determine their mental condition. The result of these examinations was the addition of a large number to our list of insane.

Overseers of Poor are now cognizant of the fact that the man who was formerly considered "just a little off," and not returned as insane, is insane, and must be so declared in reports. Add to this the knowledge acquired by these same officials of the real value of a hospital for the insane, and we see why the apparent increase of insanity is greater than the real. "The visible insane" now comprise nearly all the insane. Formerly a large number of the insane were invisible, kept at home by friends and not reported, therefore not known at the central office. At that time asylums for the insane were looked upon with much distrust by the average inhabitant, and usually only those people were sent to such a place whom it was impossible to keep at home. Now the reverse is true. The hospital is the first place thought of.

Another factor is the accumulation of chronic cases, who, under systematic rules and hygienic surroundings, live to a greater age. These swell the numbers and make the existing percentage high.

While our population has doubled and the insane under supervision has increased a little more than correspondingly, I am unable to see that the number of insane paupers has quadrupled, as stated by the speaker. We will say that there were in 1867, in round numbers, twenty-five hundred insane people under public supervision, and eight hundred supported at private expense, or about one-third of the entire number. At the present time, while the number of town cases is apparently large, it is in reality much less than it appears, for the reason that of late years, in order to secure a more moderate rate (no private patient being taken at any hospital for less than \$3.50), friends of patients avail themselves of the opportunity to reimburse towns, paying the town rate, namely, \$3.25. In this way we had last year 809 cases which appeared in the State reports as town cases, but which in reality are private cases. This number, added to the 743 private cases reported as such, makes 1550 private cases, a little more than twenty-five per cent of the whole number. While this is a falling off from the thirty-three per cent of thirty years ago, it certainly is not so decided a drop as from one-third to one-ninth, or from thirty-three per cent to eleven + per cent.

"Aggregating the insane in masses" does not necessarily mean overcrowding. Patients may be crowded in a small hospital as easily as in a large one. The size of a hospital is not half so important as the number put into it. A hospital like Worcester, with its numerous and large wards, can classify and take care of its patients even though it has a large number. Great harm can and does result from overcrowding, but not necessarily from aggregation of patients, properly classified in a large hospital.

Recoveries,—why are less reported now than thirty years ago? Because more care is exercised in determining what constitutes a recovery, and by use of different methods of tabulation. In the early years of reporting admissions, recoveries, etc., from hospitals, it was the custom (certainly in one hospital, and presumably in others in the State) to make up the list of recoveries at the end of the official year. A person was considered recovered if he had not returned for further treatment; in other words, he was considered recovered if he had not again needed and received hospital care. Under the head of recoveries were given nearly if not quite all those whom we now discharge as "much improved," there being at that time no such distinction made. A marked difference is noted in recoveries as tabulated to-day, from the fact that our tables are based upon the condition of patients at the time of discharge. It would seem as if this difference in methods would account largely for the apparent diminution in the number of recoveries.

Another factor may be mentioned, and that is the character of first

admissions to hospitals. Taking for a standard of recent cases those whose insanity has existed less than a year, and for chronics more than a year, we find that the recent or probably curable types reported are less in number than they were ten years ago. At that time, 1887, the percentage was 62.95, while for 1897 it was 50.79, a decided decrease in the material from which we may expect the most of our recoveries.

Were the crowding of our large hospitals a hindrance to recovery, there has been no time for the last twenty years when this would be more apparent than in the years just previous to the opening of Med-field Asylum. It is well known that every bit of available floor space in our hospitals was occupied there at night by cot beds, in some hospitals over three hundred being made up each night. I do not wish to be understood as endorsing overcrowding, or believing that it can be anything but injurious, but that it *largely* diminishes recoveries during these years is not proven, as the following table, showing the number of admissions and recoveries within the year at the five State hospitals, from 1893 to 1897 inclusive, will verify.

RECORD OF CASES WITHIN THE YEAR.

	1893	1894	1895	1896	1897	Mean
Number admitted.....	1732	1731	1707	1884	1742	
Of these recovered.....	223	183	185	202	192	
Being per cent.....	12.88	10.56	10.84	10.72	10.87	11.2

The above table¹ indicates that in spite of the overcrowding which existed the number of recoveries did not materially decrease, and it would seem a proof of the benefit of modern scientific treatment that the number of recoveries was kept up in spite of the ill effects of overcrowding; also a proof that the increase in the number of our insane is not due to the "failure to make recoveries."

The increase in the number of our insane must be accounted for in other ways, and it seems to me to be chiefly due to two causes: first, to the regular increase of our population, and second, to our knowledge of the actual amount of insanity—which had not previously been ascertained.

The good work of our hospitals, and the resultant benefit to the community, should not be based entirely upon the number of recoveries. Those patients who are discharged as much improved and improved, who become partly or wholly self-supporting, are to be considered, as they are a large factor. Likewise we should not forget that many of those remaining are so improved mentally and physically as not only to require less care themselves, but in very many cases to be able to labor under supervision and to assist in the care of those less fortunate.

Therefore it seems safe to say—

¹ Compiled from Reports of State Board of Lunacy and Charity.

1st. That the increase in our visible insane is due principally to an increase in population and to a more thorough investigation.

2d. That the decrease in the number of recoveries reported between 1868 and 1898 has been due to different methods of reporting them and to a more careful diagnosis, and that there has been a perceptible gain in recent years.

3d. That while there has been an increase in the number of insane paupers in thirty years, the percentage is small and will probably be no larger.

CHAS. E. WOODBURY,

Inspector of Institutions, Mass. State Board of Lunacy and Charity.

BOSTON, March 18, 1898.

A Quarterly Bibliography of Psychological Literature

(*Extracted, by permission, from the Index Medicus.*)

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Half-Yearly Summary

The SUMMARY of the present issue contains the usual references to structural improvements and advances in medical work and the training of nurses. The tendency to extended classification is indicated by reports from two colonies for epileptics, those of New York and Pennsylvania, and Dr. Godding emphasizes the value of this distinction in the experience at St. Elizabeth with separate buildings for these patients, a plan which has also been carried out at Petersburg, Va. The reports upon hydrotherapy from St. Elizabeth and Danvers reveal the possibilities of important and inexpensive therapeutic resources. Several institutions (Sheppard, Worcester, Northampton, and St. Lawrence) have adopted systems of case-recording, the feature of which is to be the bedside notes, and the filing and preservation of the original records, for the better utilization of the time of the physicians. At the Worcester Lunatic Hospital efforts in this direction have taken precedence, and the experience of a year shows the wisdom of the scheme of reorganization which was fully described in the SUMMARY of last April.

DISTRICT OF COLUMBIA.—*Government Hospital for the Insane, Washington.*—The Annual Report for 1897 deals almost entirely with medical subjects. The Board of Visitors urge upon the Government the necessity of measures for the prevention of malaria arising from the accumulation of alluvial deposit, sewage, and a rank vegetable growth choking up the river bed.

Separate provision for the epileptic insane has been in operation long enough to demonstrate its superiority over the former promiscuous arrangements. The Dix Buildings 1, 2 and 3 for the females, and Oaks 1 and 2 for the male epileptics, afford liberal accommodation for 150 of this class. Dix No. 3 is for the colored female epileptics. As yet no distinct provision has been made for the colored males, but it is the intention to provide a dormitory for them in the extension to the West Lodge, for which an appropriation is asked in the estimates for the coming year. In addition to the advantage of separate grounds for exercise, and that of a continuous night and day service of attendants, a

pleasant and liberal feature of these buildings is found in the broad piazzas that surround them, available in all pleasant weather for seats and promenades. The inmates enjoy them very much, the period of outdoor life being greatly extended thereby, the occupants avoiding or following the sun according to the season. These piazzas are open wards in the true sense of the word. St. Elizabeth, with its growing burden of feeble and old soldiers, is coming more and more to be an infirmary, a hospital in fact as in name. Congress at its last session provided by appropriation pavilion buildings for 150 of these veterans, and plans have already been prepared in which these open outdoor spaces of piazzas and corridors are a prominent feature.

The extension of the pathological building, now well advanced toward completion, will afford greatly improved facilities for microscopic, bacteriological and photographic work.

The experience of another year with the active treatment of selected cases of paresis by the wet pack with cold to the head and enforced rest followed by a thorough massage has not led to its abandonment; rather to a belief in its efficacy in a considerable percentage of the cases thus treated, in its power to effect at least a temporary improvement, and now and then an arrest in the progress of the disease for an indefinite period.

In 1893, hydrotherapeutic methods were tried at the Toner Building in connection with massage, rest, diet and other usual modes of treatment. The field was hardly favorable to any system of curative treatment, the patients then being for the most part physically broken down, exhausted by brain disease and other complicating disorders common to the chronic insane.

The choice of hydrotherapeutic processes was restricted by the resources of the hospital to hot, warm, and cold baths in tubs, the wet pack and an improvised douche consisting of rubber hose attached to the combined hot and cold faucets of a bath tub. Nozzles of different forms were constructed by the plumber for the individual need. The stimulative and revulsive effects were those first sought, not much being anticipated beyond what might be obtained through circulatory changes, especially those of a tonic character. With this object in view the wet pack and the cold douche came to be the most used. With selected cases these were used regularly, generally daily. Massage and passive exercise were combined in many of the cases.

With such subjects marked and immediate effects were scarcely to be anticipated. But with anticipations thus moderately pitched the results were almost without exception very gratifying, as shown in improved surface circulation and temperature, with gain in appetite, in body weight, in secretion, and in increase of the red blood corpuscles. In most of the cases the mental improvement was commensurate with the physical changes. After a time it was observed that a majority of the patients went to sleep in the pack with a considerable regularity. Their rest was better at night, so that hypnotics came to be less and less used, while

the wards were practically undisturbed by noise from the inmates at night.

The soothing effect of the pack in insomnia and excitement has been abundantly proved, also that it is absolutely safe if properly used, and that to the intelligent physician it is a most valuable aid in all the varied forms of brain disease. Of its action in other forms of disease Dr. Foster, who has carefully studied its effect in his observation of the cases at the Toner Building, says:

It has been found that not only do the applications of this system become more definite and certain to the mind of the physician by its continued use, but the range of application constantly widens, so definite are the physiological results and so varied the morbid states susceptible of direct relief. Take, for instance, its important therapeutic action in equalizing vascular tone and pressure and producing a steadier blood current, and consider its application to the great class of local congestions. As an example of this therapeutic action thus applied let me cite three cases of bronchitic asthma brought to these wards within the last fifteen months. They were all suffering with distressing orthopnoea, which had seriously interfered with sleep for many weeks, so that they were much reduced in flesh and strength, presenting the usual picture when occurring in subjects enfeebled by organic disease.

In each case the first night after the use of the pack refreshing sleep was secured, and the condition was gradually so alleviated that distressed breathing has practically disappeared in all, one having been discharged to the care of friends. I shall not attempt here to mention in detail the various physiological effects obtained by the use of water under varying thermic conditions, as well as those of pressure and impact. Suffice it to say that the effects in general sought for are obtained through reactions of the nervous system, and are mainly not the primary but secondary reactions. It may be appropriate to put forth one hypothesis which I have not seen expressed elsewhere, to the effect that the clearing and strengthening of mental processes, which has sometimes been very marked, is produced by direct cortical stimulation through the sensory nerves of the skin. These excitations having reached the body sensation area of the cortex tend to pass on, as the law is, to other associated systems of cortical cells. These powerful excitations by simultaneous discharge throughout the entire body-center may well force many association pathways which had become disused and difficult, and so affect the nutritive function of inactive cortical cells, thus affording the initiative to wider and wider effects throughout associated neurons. If the process be indeed as thus surmised, we have an agent of brain therapy unique in the directness as in the extent of its application.

An important principle, and one well recognized, lies in the susceptibility of individuals to education in the reaction process. From this it results that even a very considerable degree of feebleness, a dilated heart and degenerated vessels, conditions generally regarded as contra-indicating this treatment, have all responded with benefit after a careful and patient educational stage.

The chief contra-indication to the pack has been found in the existence of febrile temperature, the confinement of bodily heat aggravating this symptom.

The hydrotherapeutic apparatus now being set up at The Oaks is that perfected and used by Dr. S. Baruch in New York City. It consists of a marble-inclosed table containing mixing cylinders for hot and cold water connected with suitable supply, with thermometer and pressure gauge attached. The arrangement is such that, by turning certain revolving levers attached to the table, temperature and pressure of the water in whatever part of the apparatus may be in use can be rapidly varied at will, while the changes are indicated upon thermometer and gauge conveniently in view. Water may thus be accurately varied in temperature from that of ice water to that of steam, and in pressure to any point not exceeding 25 pounds.

A compartment of a large room, the former 10 by 18 feet, is provided with a slat floor above a cement-lined basin having an outlet to sewer at its most dependent portion. This compartment has its walls lined with marble and tiling, and contains a full-sized bath tub, a sitz bath, a circular needle douche about 6 feet high, formed of finely perforated parallel tubes, a rain bath, and a movable hose douche, with suitable nozzles. On the outer side of the compartment wall is a marble shampoo slab, with suitable floor and basin. To one side are three hot boxes, in which the patient may sit surrounded by air having the temperature of the hot room of a Turkish bath while the head is exposed to the ordinary air of the room. There are immediately connected with the main room by a corridor a series of small, well-warmed apartments provided with suitable couches for massage, packs, or for rest at suitable stages of the treatment.

Dr. Blackburn's Pathological Supplement to the Report contains the "Synopsis of Post-mortem Examinations in One Hundred and Ninety-seven Cases of Internal Pachymeningitis."

INDIANA.—*The Northern Indiana Hospital for Insane, Longcliff, near Logansport*, reports the construction of a new cold store, with accessory offices for the care and issuance of all perishable subsistence supplies; also the construction of 25,000 square feet of vitrified brick pavement. Continued attention is being paid to improvements in pathological work and methods of clinical diagnosis. The training school established a year or more ago, in which attendance is obligatory, continues to elicit interest on the part of students and is bearing fruits.

ILLINOIS.—*The Illinois Western Hospital for the Insane*, located at Watertown, is to be ready for the reception of 350 patients on the 1st of April. Certain counties in the western part of the State will be assigned to this new hospital, resulting in transfers of patients from the Northern and Central Hospitals. Dr. W. E. Taylor, a physician of high standing and eminence in the profession, has been appointed superintendent.

—*The Central Insane Hospital at Jacksonville* is to establish its own water works.

IOWA.—*Iowa Hospital for the Insane, Independence*.—Dr. Albert M. Barrett, who is the third assistant physician and pathologist in this hospital, is spending a year in the Worcester Lunatic Hospital as a junior assistant, for the purpose of studying insanity in a clinical way in order to work in the new pathological laboratory of that institution under the direction of Dr. Adolph Meyer.

—The Legislature of Iowa, which is now in session, is likely to dispense with local boards of trustees and to substitute a Board of Control, consisting of three men, to have charge of all the State institutions.

MARYLAND.—*The Sheppard Asylum, Towson*.—Constant endeavor has been made to enlarge the scope and improve the character of the general medical and scientific work of the institution. A carefully devised system of records, to supplement the physicians' notes in the case books, has been put in operation, and the statistical facts of all the cases have been arranged upon a card index system, so that it is now possible to group together, for any purpose of study, the essential facts of all cases of any form of mental disturbance.

A new and larger room has been assigned to the laboratory, which has been gradually fitted up as needs have required. The value of such an adjunct to the clinical work is daily becoming more and more appreciated, and it does not seem at all improbable that as the work increases it will be necessary to enlarge not only the resources in this direction but the working staff.

MASSACHUSETTS.—*Worcester Lunatic Hospital*.—The last Annual Report, recently issued, contains the following reference to the organization of the medical work in the hospital:

"The plans for the reorganization of the medical work of the hospital have now been in operation a full year. As was perhaps inevitable in such an important and wide-reaching an undertaking, we find that we have not accomplished quite all that we had hoped, and that our plans have still to be perfected in many of their details; but the results already attained have been eminently encouraging, and fully warrant all the outlay in the way of time, energy or expense which has been found necessary in carrying them out. Although our work is greatly increased, no one would now for a moment think of returning to the old methods. Besides making an exhaustive study and full record in all recent cases, we have, so far as possible, compiled the histories of the older patients after the new plan, making them as full and accurate as the lapse of time since the inception of the disease would allow. We have also taken advantage of the relief given us from overcrowding (through the transfer of some two hundred chronic cases to the Medfield Asylum) to reclassify our patients, grouping together all of the recent cases, and those in

which the disease is still in a transition state, on the first two floors of the hospital, where they can more easily be observed.

"The staff of the hospital now consists of the superintendent, who is in charge of all the medical and administrative work of the hospital; he is assisted by the assistant superintendent, who is at the same time in direct charge of the acute cases of the female department; the second assistant is in charge of the acute cases of the male department; and the third and fourth assistants have the wards for the chronic patients. Each assistant physician has a junior assistant to help him. The supervision over the purely medical work of the hospital is put in the hands of a physician who is as far as possible free from routine and administrative duties, and who is director of the clinical and pathological work.

"The division of labor is carried out as follows: the first floors are reserved, as has been stated, for the observation cases; the second floors, for observation cases and some private patients; the third and fourth floors are occupied by patients who do not need continual clinical observation in the strict sense of the word, *i. e.* chronic cases and patients in stationary phases of their disease. Each physician has two floors of the male or female side under his charge.

"The patients are given a complete mental and physical examination as soon as possible after admission. The examination is made by the physician in charge, with the help of the junior assistant. The physician on the third and fourth floors also takes his share of examinations, since his medical duties are considerably less than those of the physician in charge of the observation cases. The history is taken by the junior assistant, from the patient, from the friends and by correspondence. As soon as the necessary data are at hand, the physician who examined the case reports to the staff meeting, makes a summary of the available facts and a diagnosis, which is submitted for discussion. A provisional prognosis is made, and where necessary the treatment is discussed. The further duty of the physician is to continue the record of the patient, with the help of the junior assistant. Notes are taken in the ward, at the medical round, and handed to the stenographer to be type-written. The clinical microscopy and analysis of urine, etc., are done by the junior assistant.

"In order to keep up a uniform arrangement and completeness of the records, the director of the clinical and pathological work outlines the scope and order of the history and the case record. He sees the patient with the physician in charge every second morning, and is responsible for the accuracy and usefulness of the record.

"The staff meetings take place from 11.30 to 12.30. The time is devoted to the report of the cases recently admitted, to those ready for discharge, and to matters of importance occurring in other patients. The report of deaths and autopsies is also considered. Frequently the patients themselves are brought before the staff for clinical demonstration.

"The autopsies are made by the physicians and junior assistants. The brain is usually examined by the director of the pathological work, and the plans for the future microscopical examination and the necessary

preparatory steps are outlined by him. The work is to some extent distributed among the junior assistants, according to their interest and ability.

"This general plan has given much satisfaction, and the attempt made to group the result of the year's observations has revealed a steady improvement of the material, and much evidence of a faithful elaboration of the plan adopted.

"Apart from the work directly referring to the patients, the medical spirit of the staff is further cultivated by regular weekly journal meetings. The liberal supply of books and periodicals allowed by the Board of Trustees makes a division of labor necessary. Each physician takes a number of journals and reports the contents briefly, frequently in connection with a short review of the whole field to which a given article belongs.

"During the winter months a course on neurology, embracing especially the anatomy of the nervous system, was given by Dr. Meyer; also occasional instruction on methods, clinical and pathological. Apart from the current work in the laboratory, the minute study of special specimens and the preparation of material to illustrate the normal histology of the nervous system were carried on.

"During the second term (January to March, 1897) a series of lectures and clinics to the students in psychology of Clark University was given, in which the medical staff of the hospital took part. During the summer school a course of ten lectures at Clark University and two clinical demonstrations at the hospital were arranged.

"This plan may safely be said to have grown, on a natural basis, out of the conditions present in the hospital, and to be the outcome of the medical needs of the institution. Its aim is to do the best that medical science can do for the patients, and to gather from the experience, systematically and conscientiously, all that may benefit the work. Thus it becomes incidentally a plan for research work, in the same way as every physician will try to use his experience for the future,—only with the advantage that the co-operation of ten physicians, with the same methods and the same end in view, will be likely to be more fortunate in the results of research than one physician alone can expect to be."

—*Taunton Lunatic Hospital, Taunton.*—The training school for nurses has now been in operation two years, and as time has gone on its value has become more apparent. Another year has been added to the course of study, making the full course for graduation three years. Hereafter all of the attendants will be required to be members of the school for two years, but the third year will be optional. The first two years are made compulsory in order to fit the attendants for greater usefulness while they are in the service of the hospital, and the third year is made optional, as it is evident that no one can become fitted for general nursing and to graduate as a trained nurse unless he is a volunteer in the work and has a love for it.

The exterior wood-work of the centre and old wings of the main building has been painted, and considerable painting has been done on the wards. Plans for the front gate-house have been made, and the cellar and foundation walls will be put in this autumn and the building completed next year. The cost of the bay window which is being built on the east middle wing will exceed the estimate, and an appropriation of \$2000 will be needed to complete the bay and other necessary repairs on the west middle wing.

Dr. Ward returned to the hospital as pathologist the first of May, and under his supervision a very convenient and complete laboratory has been fitted up in the basement for pathological work, at a cost of about \$1500.

—*Northampton Lunatic Hospital, Northampton.*—The medical staff is devoting much care to the new cases and to those whose mental condition offers any prospect of improvement. On admission a careful examination is made of each patient, and one of the staff is expected to spend some time with the patient, becoming acquainted with his condition and peculiarities, and making him feel at home as much as possible. Urinary analyses and examinations of the blood are made in every case as soon after admission as possible, and as frequently thereafter as necessary.

Patients suffering from acute mental troubles and those in any degree exhausted are at once put to bed, cared for by nurses who devote their whole time to two or three such cases.

The much-needed training school for nurses has been delayed, but instruction has been given daily at the bedside, where it is put to immediate use. A course of general instruction is to be given as soon as arrangements now under way can be perfected.

A better system of making records has grown up in the last two or three years. A full history of the case is obtained of friends at the time of admission or as soon after as possible, and for the first few weeks daily notes are made. On discharge a summary is entered in the case book.

Regular meetings of the staff will be held for consultation about all cases admitted and discharged, and to consider important matters that may arise.

Plans for infirmary wards are completed, but there is little expectation of their being built this coming year. Meanwhile, to facilitate the work, one ward on each wing will be fitted for the reception and observation of new cases, and one will be used as a sick ward.

Laboratory work is at present done under very unsatisfactory conditions. The changes which are expected to be made this year provide for a room well lighted and fitted for scientific work.

—*Danvers Lunatic Hospital, Danvers.*—The Annual Report contains the following reference to hydrotherapy:

"The prolonged tub bath and dry pack have not been used. As a rule, cold wet bandages have been applied to the extremities, each limb being bandaged independently of the others, thus permitting ordinary freedom of movements. The full cold pack by wet sheets has been so loosely applied that patients, if so disposed, could readily remove it unless prevented by the nurse, who always remains by the side of patients when in the pack. The time of application is limited to thirty minutes, and obstinate resistance is seldom encountered.

"In our experience, hydrotherapy is a most gratifying substitute for hypnotic and sedative drugs.

"It seldom fails to relieve insomnia, and several cases that could not be controlled by drugs readily yielded to the cold pack. It calms acute excitement, and chronic patients, subject to periodical disturbance, have had their attacks modified and cut short by the same means. Several cases of prolonged melancholia, on the verge of dementia, have been cured while being treated simply by the external application of water.

"In a number of instances obstinate constipation has been entirely relieved by the cold water girdle applied each evening. Cold sponging has been employed, and successfully, to reduce temperature. We have used cold baths for their tonic effects to a considerable extent for several years. Recently we have introduced the needle bath with douche table and other forms of apparatus for water treatment.

"Our personal experience with this form of hydrotherapy is too limited to warrant conclusions. However, its employment with cases of neurasthenia, anæmia, etc., at the Vanderbilt Clinic, New York, and the German Hospital in Philadelphia, has been so successful that we can but believe it will prove of much service in the lunatic hospital."

—*Boston Insane Hospital.*—In June of last year, by an act of the Legislature, the Boston Insane Hospital was placed under the care of a board of seven trustees, two of whom must be women. The trustees were appointed by the mayor of Boston, and the hospital then passed from under the control of the Commissioner of Institutions to that of the new board of trustees. On the board, as it is at present composed, are three physicians, all of whom have had practical experience in institutions for the insane. This board have also supervisory control of all the insane of the city now supported in State institutions.

In accordance with a recent vote of the board, the wards at Pierce Farm (190 beds) will be used exclusively for men, and one asylum ward at Austin Farm (112) beds will also be used for men. The other buildings at the Austin Farm will be used exclusively for women patients.

During the past year an unusual number of recent commitments have been received at the hospital, as it is the policy of the present management that the recent cases shall receive treatment within city limits instead of, as formerly, sending such cases away to State hospitals.

—*Hospital for Dipsomaniacs and Inebriates, Foxborough.*—The classes in physical training continue to confer marked benefits upon the patients.

The instructor, Mr. Ernst Hermann, has made methodical examinations of each person, first when in proper condition to commence the class work and again when about to be discharged from the hospital. Some of the patients are necessarily excused from attendance because of advanced age or physical disabilities. The amount of gain varies greatly among the individuals, and for various reasons—physical infirmities, organic disease, age, lack of desire to participate in the exercise, or, on the contrary, great willingness to take it. The larger part of the patients require at first much urging to overcome the sluggishness and inertia which results from their diseased condition, but there now appears to be less unwillingness to participate than when the classes in physical training were first established. It is noted that the individuals who attend the classes regularly and with interest are quite apt to speak voluntarily and happily of the benefit they have derived from the training.

Vertical tracings of the trunk are taken of representative cases at different ages, ranging from twenty-five to sixty-three years, showing the improvement made in the lines of chest and abdomen, greater erectness of carriage, greater depth of chest, higher breast-bone. It is worthy of notice that some of these improvements can be made even in those who are beyond fifty years of age or are suffering from serious infirmities. In a considerable number of persons improvement in the condition and action of the heart has been noticed. By massage and medical gymnastics great benefit has been conferred upon a considerable number of sprained or stiffened joints and weakened limbs.

MICHIGAN.—*Eastern Michigan Asylum, Pontiac.*—The curriculum in the training school for attendants was altered at the commencement of the year's work (September), so that the instruction is offered in a graded course of two years' extent. Instruction to the junior class is in the form of lectures, following closely the order and substance of the chapters in Wise's text-book, supplemented with whatever additional matter may seem proper to the instructors. In addition to the text-book, each member of the class is provided with printed syllabuses of the lectures. In the senior year reliance is still placed upon the text-books, but the order and substance of the lectures vary from them to a greater extent than in the junior year. Practical instruction in the preparation of food for the sick is given to the women of the senior class during the winter months. It is designed to give members of the senior class clinical demonstrations on the wards of subjects taught. Members of the senior class also attend surgical operations by sections, and receive instruction in the details and technique of the operations. A circulating library of all recently published text-books on nursing and allied subjects is maintained for members of the school and graduate attendants.

An electric lighting and power plant has just been installed. The generating sets are in duplicate. The dynamos, of Siemens & Halske manufacture, are each direct connected to a Russell 4-valve engine. The

generating sets are each of 100 K. W. capacity, driven at a speed of 200 revolutions per minute. The lamps in the building are operated at 110 volts, and the wiring, which is all concealed, has been planned for a possible 2000 lights. Electric motors replace steam power in the shops, laundry, granary, silo and kitchen. Exhaust from the engines is utilized during the winter months in the heating of the building.

MISSISSIPPI.—*East Mississippi Insane Asylum.*—The only recent improvement has been the boring of a deep well, capacity 90 gallons per minute, and the erection of a steel tower 90 feet high with 25,000 gallon tank. Since using the congregate dining room, the capacity of the institution has been increased from 250 to 300.

A training school for nurses on a small scale has recently been organized. Dr. J. R. Tackett, who was assistant for three years, resigned in June to engage in practice at Biloxi, Miss. He had charge of most of the yellow fever there during the recent epidemic, and did a great work before he had the fever, from which he recovered slowly.

The Legislature will be asked to erect cheap pavilions for chronic patients, as both asylums are full. The per capita expense for the year has been \$123.

NEW JERSEY.—The most important thing in connection with the care of the insane in New Jersey at present is a bill before the Legislature providing for certain changes to be made concerning the admission of patients. If the bill passes, all persons, no difference whether private or county, will require the certificate of two physicians under oath as to the insanity of the individual; also, no person may give a certificate who has not been in actual practice for at least five years, and must not be related, by marriage or consanguinity, to the person alleged to be insane.

—*New Jersey State Hospital at Trenton.*—The new laboratory is rapidly approaching completion. The building contains four rooms: one for microscopy, one for chemical analysis, an autopsy room, and a room for photography and micro-photography.

The census of the hospital is eleven hundred, with an actual capacity of eight hundred. A bill is pending before the Legislature for an appropriation for the erection of an infirmary for the care of the feeble, old, infirm and paralytic, for the purpose of relieving the wards and providing better care for this class of patients.

NEW YORK.—The foremost question in the administration of the State hospitals during the past few months has been the adjustment of food supplies to dietary requirements and the balancing of dietaries. Connected with this question has been the improvement of the dining-room service, both in efficiency and strength of force, with a two-fold view of preventing waste and increasing observation and the contentment and

welfare of patients. A distinct gain in all the purposes has been secured. It is probable that Prof. W. O. Atwater, the food expert for the U. S. Department of Agriculture, will take the dietaries of the State hospitals under consideration and prepare a ration table upon a scientific basis. His report will be of value to all institutions.

Preparations are being completed for the abandonment of Blackwell's Island Department of the Manhattan State Hospital, by the transfer of the 840 patients to accommodations provided at Poughkeepsie, Buffalo, Ogdensburg and Kings Park. The State is under contract to New York City to relinquish both Blackwell's and Hart's islands to the City in 1901. Contracts are about completed for building a hospital ward pavilion on Ward's Island for 500 women patients as receiving wards and for the treatment of acute cases. There will probably be no further extension of buildings on Ward's Island, and future provision will be made at the Central Islip Department on Long Island.

It is estimated that all the insane in the State will have adequate and proper provision by the close of 1899, and that the number in custody will not exceed the certified capacity of the institutions in the absence of the destruction of buildings by fire.

Notwithstanding the increase of population in the State hospitals for the first quarter of the fiscal year ending January 1, 1898, over the corresponding period of the previous year, the aggregate expenditure for maintenance for the former period has been \$43,000 less than in 1896. The cost of food supplies for the '97 period is estimated to be 15 per cent in average excess over the '96 period.

There has been a general improvement in ward service, which is largely due to a gradual increase in ratio of attendants, improvement in qualifications through training school methods, and by the lengthened service resulting from the uniform wage schedule which has been in operation for nearly three years. The ratio of day and night attendants to patients in the several departments is as follows: Utica, 1 to 7.6; Willard, 1 to 8.9; Hudson River, 1 to 6.96; Middletown, 1 to 7.6; Buffalo, 1 to 7.7; Binghamton, 1 to 6.7; St. Lawrence, 1 to 6.3; Rochester, 1 to 8.3; Long Island, 1 to 7.8; Manhattan, 1 to 7.8.

Arrangements have been made by the conference of superintendents to purchase standard articles of supplies for all the hospitals in a combined contract under the following provision of the insanity law: "Contracts may be entered into jointly by the representatives of the managers of two or more of the State hospitals for such staple articles of supplies as it may be found feasible by the commission for the hospitals to purchase in bulk under such contracts."

The manufacture of supplies in the hospitals for all the State hospitals has been materially extended. At Utica there has been erected a coffee-roasting and spice-grinding plant, and all the hospitals are now being supplied from it, thus insuring uniform and absolutely pure products at their actual cost. St. Lawrence is to establish a butter-making plant. A soap factory is under construction at Rochester, where all

grades of soap will be manufactured for the hospitals. Several of the hospitals have increased their facilities for the manufacture of boots and shoes and clothing. Quite extensive projects for the increase of vegetable, fruit and farm products are in progress.

—*Willard State Hospital, Willard.*—A somewhat larger proportion of the patients have been employed in the various industries of the hospital, particularly in the matter of out-door employment on the farm and grounds and the manufacture of clothing for the hospital, including foot-wear. In the latter department considerable extension has taken place, and with special machinery allowed by the Commission in Lunacy, it is hoped soon to be able to manufacture all the boots, shoes and slippers used by the patients. Two hospital wards for the acute sick from the general wards of the institution have been opened at the main building, one for women patients and the other for men patients, and these have been arranged to have operating rooms, and a somewhat larger amount of equipment has been provided in the way of instruments, apparatus, etc. A pathological laboratory has been started and is at this date nearly equipped. With the addition of some extra apparatus, this will soon be ready to do all the ordinary work of the hospital, including such bacteriological work as it will be necessary to do, in making cultures from suspected cases, should a disease such as diphtheria again appear. The hospital suffered from this disease quite a good deal during the past year, the trouble appearing in February of '97 and lasting until late in the fall. A large number of cases were found during that time, though only one fatality occurred.

—*Hudson River State Hospital, Poughkeepsie.*—The new north wing which has been building for the past two years has just been opened. The completion of this wing, together with changes in the south wing, affords increased accommodations for 500 patients, thus bringing the capacity of the hospital up to 2000. The new wing, besides adding greatly to the architectural appearance of the main hospital, supplies the great need, which the hospital has heretofore felt, of suitable accommodations for the acute and convalescent cases among the men. The services of both men and women have been rearranged with the idea of providing the best possible treatment for the acute and hospital cases and the most congenial and pleasant surroundings for the convalescent and quiet part of the population. The additions and alterations mentioned render this possible to a greater degree than ever before.

Not the least important feature of the new building is the provision of attendants' quarters on the upper floor where they are away from the noise and anxieties of the wards. A nurses' hall has also been provided on the south side, so that now only enough nurses are required to sleep upon the wards to secure proper care of the patients in case of accident or panic. Night nurses are of course necessary on every ward, and it is this fact which makes the provision for nurses outside of

the wards such a desirable feature of hospital administration. The care of the insane during the day has made rapid strides during the past decade, and proportionate advances must now be made for their care during the night.

Extensive changes, which have been made necessary by the increase in population, are under way in the kitchen and laundry buildings.

Training School for Nurses.—For the thorough training of nurses in the care of the insane a two years' graded course is provided. Lectures are given semi-weekly by the staff, and practical training is carried out upon the wards. Dr. Wise's manual is used in the quizzes, and the lectures are largely based upon it. Entrance examinations are required, and there are also examinations at the end of the junior and senior years. The last examination is conducted by a committee of superintendents of the various State hospitals, thus insuring fairness as well as fitness.

During the last two years lectures have also been given to a class of young women from the city of Poughkeepsie, who are known as "Professional Attendants," their aim being to become sufficiently trained to care for convalescent cases after the services of a trained nurse are no longer necessary, and for chronic cases where a high degree of efficiency in nursing is not required. They are permitted to charge but \$5 per week, and it is said that there is a fair demand for their services. They are in no way connected with the hospital, the lectures being given merely to help carry on the project.

Classes in social science from Vassar College also make occasional visits to the wards for the purpose of observation and instruction.

—*St. Lawrence State Hospital, Ogdensburg.*—The new system of blank forms approved at a recent conference of hospital superintendents with the State Commission in Lunacy has been adopted and is now in operation. Much relief from clerical work is anticipated for the staff, thus permitting them to devote more time to their medical and ward duties. Every member of the staff devotes a part of each day to original work in the laboratories.

A new herd of 108 cows has been purchased to take the place of the herd that had to be destroyed on account of tuberculosis.

The farm cottage is nearly completed and we hope to occupy it early in April. Steps are now being taken to install a creamery plant in the milk-house, thereby providing for the manufacture of all the butter for the hospital.

The shoemaking industry has been recently inaugurated, and all the shoes for patients are now made at the institution. A room in the basement of the infirmary has been equipped with the necessary outfit for making rustic work, such as flower boxes, seats and chairs. This has been done at a trifling cost and affords occupation to a number of patients who during the long winter days are without regular employment.

—*Manhattan State Hospital, Ward's Island, New York City.*—On March 7, 1898, the east wing of the main building, comprising three wards, was occupied and accommodates 81 patients. This building was destroyed by fire, March 30, 1897, and though the work of reconstruction was commenced immediately, numerous delays were encountered and nearly a year passed before its completion. The bath-rooms of these new wards are equipped with rain-bath and Gegenstrom apparatus and every necessary convenience, and will add much to the comfort of patients.

The training school is completing the second year of its course and is making good progress, but is much handicapped in the work of organization and instruction because of the frequent changes among the corps of attendants. This is one of the principal causes operating to keep the membership in the school at a low number, and especially is this the case in the senior class, which now contains only ten persons. The junior class has at present a membership of about 75.

Last December 125 patients were transferred to the Willard State Hospital, but this gives practically no relief from overcrowding. The number of admissions per month averages about 61, and the number of discharges about 40.

—*Brooklyn Department, Long Island State Hospital.*—It has been decided to remodel and renovate the annex at a cost of about \$25,000. The capacity of the building is 300, and it has a separate heating plant with kitchen and laundry facilities, all of which are at present in bad condition.

Provision has also been made for enlarging the amusement hall. This work is expected to be completed during the coming summer.

A pathological laboratory has been established.

A training school was established two years ago, and the first class will graduate in May. There are twenty candidates for final examination.

—*The Craig Colony, Sonyea.*—The Legislature of 1897 gave the Craig Colony special appropriations as follows: Dormitory buildings, \$40,000; administrative building, \$30,000; furnishing, \$12,000; extension of water and sewerage systems, \$5000; six tenement houses, \$5000; slaughter-house, \$1000; piggery, \$1200; hennery, \$1200; granary, \$2000; blacksmith shop, \$1000; two horse stables, \$3000; plumbing and heating west group, \$5200; plumbing, heating and ventilating hospital building, \$5000; nursery, forcing beds, roadways, walks and grading grounds, \$2500; for industries, including a two-story brick building, \$5000; laundry machinery, \$750; general repairs and improvements, including sheds for cattle and sheep, fencing, moving buildings, painting barns and out-houses, increasing storage capacity for coal, improving creek water supply, and increasing spring water supply, \$6750. Total, \$126,600.

The work under these appropriations is about completed with the exception of the administrative building, which will be ready for occupancy about June 1.

In the development of the colony a persistent effort is being made to develop its industrial features conjointly with the increase in population. Dr. Spratling is of the opinion that no other single factor is capable of doing the average epileptic so much good as systematic employment, and to promote this idea he is endeavoring as far as possible to employ industrial teachers instead of ordinary nurses or attendants to care for patients.

The Peterson Hospital for twenty-six acute medical and surgical cases was recently opened. As a part of the hospital is an out-door department. Patients go daily to this department for examination and consultation. An operating room, thoroughly equipped and modern in every respect, is a feature of this building. It has also special provision for work in micro-photography. A laboratory building is in process of construction. A training school for nurses has been organized and is in successful operation. The class organized with twenty members.

OHIO.—*Longview Hospital, Carthage.*—The most important improvement of the year has been the new building for employees, which was occupied on the 21st of October, 1897. This building contains a tailor shop 40x50 feet, twenty-three commodious rooms for female employees, and a dining-room 40x50 feet, all finished in yellow pine. The floors are deadened with two inches of cement; the partitions are of iron and cement; the stairways are of iron, making the entire building vermin-proof and as near fire-proof as possible. The dining-room is nicely fitted out with new tables, linens, and table furnishings complete. This room affords a bright contrast to the dismal quarters in the basement formerly used as dining-rooms.

PENNSYLVANIA.—The change of policy in the care of the insane in Pennsylvania, by which the State offers to all counties or cities the sum of one dollar and fifty cents per week for each patient supported by the county or city in their local insane hospital or asylum (or almshouse), will be watched with keen interest by all those who have believed that the insane are as truly the wards of the State as any other class of dependents. The labors and responsibilities of the State Committee of Lunacy will be greatly increased, and as at present organized, with but one imperfectly salaried official, the proper and needed supervision and watchful care of these local institutions cannot be accomplished.

—*The late Dr. Kirkbride.*—From the *Public Ledger* the following account of the presentation of Dr. Kirkbride's portrait to the College of Physicians of Philadelphia is extracted:

The presentation address was made by Dr. John B. Chapin. The address was a valuable addition to the history of medical progress during the last half century and showed the very important part taken by the subject of the sketch in that progress. When, on its erection in 1840, Dr. Kirkbride was placed in charge of the new hospital in West Phila-

delphia, the proper principles regulating the care and treatment of the insane were not generally recognized or understood. From the death of Rush to the time of Kirkbride little had come down of the medical care of the insane in the city or State. It was a common spectacle to see insane men chained to the buttonwood trees about the almshouse of the old city. With the opening of the new hospital Dr. Kirkbride's annual reports to the Board of Managers were published; and no similar publication aroused so much attention, had such far-reaching results or did as much to awaken public sympathy. So interwoven were his thoughts and actions with the hospital service that its published reports furnish material from which the record of his life must be drawn.

He boldly advocated the abolition of mechanical restraint, except in extreme cases. The wards were made attractive, the grounds beautified, and occupation, diversion and amusements were encouraged. Nurses and attendants were trained. Dr. Kirkbride laid the broad foundations of a scheme for humanity in the care and treatment of the insane which is destined to endure and flourish long after the generation in which he lived shall have passed away.

In accepting the portrait, the president, Dr. Da Costa, said it was a great pleasure to receive it within the same year that the portraits of other distinguished members were placed upon the walls. The great leader in clinical medicine, Dr. W. W. Gerhard, came to the college last year, and now there was added the pioneer of another branch of great importance to the community, where in every respect his name has become so thoroughly identified with it. The portrait, which, he said, was admirable, would remain, and always prove how worth has been valued by the college, and would be an incentive to every one to make efforts alike for the college and for the profession.

—*State Asylum for the Chronic Insane, Wernersville.*—Many improvements have been made during the year which were necessary or expedient. The barn and shop buildings have been wired for electric light; local telephones, connecting the Superintendent's office with various parts of the house, have been installed; two large ovens, of the Duhrkop pattern, have been built, and a well drilled and a thoroughly organized fire department, with a system of steam whistle signals, is ready for action at any time.

The old boiler house has been changed and fitted up for a store room, and steam connections to the day building have been changed and relaid in such a way as to result in a great saving of steam and better service. Many yards of rough stone wall have been built and one large new bridge has taken the place of an old one. Many improvements have been made in the water supply, the most notable of which is the construction of a large sand and gravel filter, which is just completed. This filter was constructed at a trifling cost, with the patients' labor, and will prove of great benefit in purifying the water. Other changes have been made in the storage reservoir and at the intake pipes.

The employment of the patients has not varied during the present year, and much work has been done that was rendered necessary by the opening of a new place.

By constant interchange with the State hospitals and very careful selection on the part of the Committee on Lunacy the class of patients now in the house is much better than at any former time.

The inside work has continued and the sewing and repairing rooms, hat and mat shop, and laundry have employed a great many women patients.

During the present year four hundred and thirty-one dresses and one thousand six hundred and forty-three working shirts have been made. This represents much more work than any previous year and is more than half the product of the same shop from July, 1894, to September 30, 1896. Seven thousand five hundred and eleven other articles have been made, being more than half the product of the two years between July, 1894, and September 30, 1896.

Last year there was a total of one thousand one hundred pillow cases, this year two thousand four hundred and forty-nine. Last year's total of working shirts was one thousand two hundred and sixty-nine, this year one thousand six hundred and forty-three.

The hat and mat shop shows even more gratifying results, for the reason that nearly twice the number of articles have been made. The total for last year was one thousand one hundred and fifteen, this year two thousand one hundred and thirty-six. The work in this shop has been enlarged to a considerable extent and a great amount of drawn-work and hemstitching has been done. The mending room has been more than ever a saving to the State. Among the four hundred thousand articles sorted during the year, nineteen thousand nine hundred and forty pairs of socks have been mended.

The laundry averages nearly five hundred thousand pieces each year.

A great many have been engaged in farm and garden work and the product of these departments shows gratifying results.

One hundred and six thousand four hundred and sixty-one cubic feet of stone have been placed in the walks and roads, and the excavation for the same has necessitated the removal of one hundred and forty-three thousand eight hundred and sixty-one cubic feet of earth. On one road twenty thousand seven hundred and thirty-six cubic feet of earth fill has been made.

The changes in the stream have made it necessary to build retaining walls in many places, and one thousand one hundred and ninety-two cubic feet of dry wall have been constructed entirely by patient labor.

In the rear of the male wards the contour of the grounds was such that to successfully turn the surface water away from the building, a great amount of earth filling was necessary. In this one location ninety-six thousand four hundred and sixteen cubic feet of earth were required. In addition to this other grading, terracing, sodding and sowing have been done and the usual work rendered necessary in caring for a large lawn.

During the present year there has been a total of eighty thousand two hundred and twenty-six days' work performed by the men, and fifty-five thousand eight hundred and fourteen by the women patients, which gives a grand total of one hundred and thirty-six thousand and forty, or more than the total amount of work done since the "Company" system was adopted in September, 1894.

—*Philadelphia Hospital, Philadelphia.*—The increase of insane at the Philadelphia Hospital (Blockley) during the past ten years has crowded this institution far beyond its facilities. To make room for the increasing population, the Bureau of Charities have completed two large modernly constructed wards on the dormitory plan, each with a bed capacity for seventy-five chronic patients. Two additional wards of the same size and style will be added during the present year, giving this hospital room for fourteen hundred patients. The present population is 1304.

The increase of patients in this hospital during the past year is shown by the following table:

Population, January 1, 1888.....	539
Patients admitted in 1888.....	394
“ “ “ 1889	306
“ “ “ 1890	283
“ “ “ 1891	278
“ “ “ 1892	497
“ “ “ 1893	466
“ “ “ 1894	479
“ “ “ 1895	522
“ “ “ 1896	591
“ “ “ 1897	592

The bathing facilities at the insane department have been increased and improved by the addition of the rain-bath system. A bath house attached to the men's wards, which is accessible from all the wards without going in the open air, thoroughly equipped, enables the entire male population to be thoroughly bathed each day without in any way interfering with the internal routine of the house and with a saving of labor and steam. A marked improvement in the health and vigor of the patients is already noticeable. It is proposed to equip the women's wards in the same manner during the present year.

The insane department is now fully equipped with electric lights both inside and out.

—*The Pennsylvania Epileptic Hospital and Colony Farm, Oakbourne.*—At the end of the second year there were twenty patients remaining, twenty-nine having been treated during the year. The results of treatment have been gratifying, all patients, without exception, having improved in general health, and their convulsions having become either fewer in number or much lessened in intensity.

The dispensary has been open daily, and the attendance upon it has increased steadily.

TENNESSEE.—*Lyon's View, Knoxville.*—Dr. Campbell writes that there will be erected this season a pavilion or detached building to accommodate one hundred patients. This structure will present some new features in hospital construction, a description of which is promised by Dr. Campbell for a later issue of the Summary.

VIRGINIA.—The Legislature which has just adjourned did not make a record for liberality towards the State institutions. "Economy, retrenchment and reform" seemed so important to the majority that no idea beyond that of "reducing expenses of the government" could be entertained. Notwithstanding the persistent and energetic efforts of the superintendents and other friends of the insane, the appropriation for every hospital except the Central was cut down. The previous annual appropriation of \$295,000 for all four of the hospitals, with an insane population of about 2700 to be cared for, was reduced to \$277,000, a so-called "saving of \$18,000 a year."

The superintendents at once stopped receiving patients into the hospitals, for the reason the reduced appropriations were not sufficient to meet the current expenses of the hospitals with their present number of patients. The number in the hospitals will be reduced, while the number in the jails will increase. Two months ago there were no insane in any of the jails or poorhouses of the State. All the insane, practically, were being cared for in the State hospitals.

No money was appropriated for additions or permanent improvements of any description.

A bill fixing and at the same time reducing the salaries of nearly all the hospital officers was passed. Heretofore the Boards of the respective institutions fixed the compensation of the various officers.

The laws regulating the commitment of the insane in this State are defective in many particulars. The superintendents prepared a bill revising these laws, but the Legislature could not be moved to appreciate the necessity or advisability of the proposed changes, apparently believing the laws enacted a century ago, more or less, were quite good enough for this day and generation!

On these matters, viz., proper care for all the insane of the State and revision of commitment laws, and some other matters bearing on the insane and our hospitals, the Legislature seemed to be lacking in a proper understanding.

The State Epileptic Commission submitted to the Legislature its report, treating fully of the question of State provision for these dependants. A colony, modeled after the Craig Colony in New York State, was recommended. The Commission also recommended that all the white insane epileptics be cared for in a separate building at one of the State hospitals. At the Central Hospital a separate building was constructed

last year and is now occupied exclusively by insane female epileptics (negroes). The Epileptic Commission, as constituted by the Legislature two years ago, was reappointed and instructed to submit to the next Legislature detailed plans, estimates and other more or less definite information regarding the proposed epileptic colony.

—*Central State Hospital, Petersburg.*—The building for women epileptics has been completed and equipped. All of the furniture for this building, except bedsteads, was made in the hospital shops at comparatively small expense. Numerous minor repairs have been made during the year.

QUEBEC.—*Protestant Hospital for the Insane, Montreal.*—A new electric light plant has been installed and is giving good satisfaction.

An additional underground water tank, with a capacity of 100,000 gallons, was constructed for fire purposes. It is connected by a supply pipe with the aqueduct which supplies water to the city of Montreal, and has been so placed that a steam fire-engine can pump directly from it.

Of the sixteen nurses enrolled for the training course of 1896-97, nine succeeded in passing their primary examination with a class average of 71.3 per cent. Four left the service before the close of the session, and three failed to secure the requisite number of marks, so were, therefore, relegated to the junior class.

In view of the prevalence of small-pox in the city during August and September, it was deemed advisable as a matter of precaution to vaccinate all the patients and employees. Of three hundred and sixty-five persons operated upon, 81 per cent of the females and 70 per cent of the males "took." All but twelve had been previously vaccinated at some period of their lives and showed good marks. In one successful case the patient had previously had an attack of true small-pox in infancy and was badly pitted therefrom.

Appointments, Resignations, Etc.

- ARTHUR, DR. DANIEL H.**, formerly Second Assistant Physician at the Middletown State Homœopathic Hospital, promoted to the Superintendency of the Collins State Homœopathic Hospital, Collins, N. Y.
- BARKER, DR. W. C.**, resigned as Second Assistant Physician at the Central State Hospital, Petersburg, Va.
- BENNETT, DR. MARIE LOUISE**, appointed Medical Interne at the Craig Colony, Sonoma, N. Y.
- BOLTON, DR. JAMES R.**, appointed First Assistant Physician at the Retreat for the Insane, Hartford, Conn.
- BONDURANT, DR. E. D.**, resigned as Assistant Medical Superintendent of the Alabama Bryce Insane Hospital, Tuscaloosa, Ala.
- CHAPIN, DR. C. B.**, appointed Assistant Physician at the Eastern Michigan Asylum, Pontiac, Mich.
- COLBURN, DR. HARRY H.**, appointed Second Assistant Physician at the Danvers Lunatic Hospital, Danvers, Mass.
- COOM, DR. WILLIAM H.**, appointed Medical Interne at the Northampton Lunatic Hospital, Northampton, Mass.
- CROSBY, DR. J. HOWARD**, formerly Interne at the New Jersey State Hospital at Morris Plains, appointed Junior Assistant Physician at the Manhattan State Hospital, Ward's Island, New York City.
- DARNALL, DR. R. F.**, formerly Assistant Physician at the Danvers Lunatic Hospital, Danvers, Mass., appointed Assistant Physician at the Northern Indiana Hospital for the Insane, Logansport, Ind.
- DONSON, DR. T. L.**, appointed Assistant Physician at the East Mississippi Insane Asylum, Meridian, Miss.
- DOWN, DR. E. A.**, resigned as First Assistant Physician at the Retreat for the Insane, Hartford, Conn.
- EDGERLY, DR. J. F.**, appointed to the Superintendency of the Pennsylvania Epileptic Hospital and Colony Farm, Oakbourne, Pa.
- EVARTS, DR. HERMAN E.**, promoted to the Superintendency of the Long Island State Hospital, King's Park, N. Y.
- EWING, DR. W. BROWN**, resigned the Superintendency of the State Asylum for the Chronic Insane of Pennsylvania, Wernersville, Pa.
- FISH, DR. J. E.**, appointed Third Assistant Physician at the Taunton Lunatic Hospital, Taunton, Mass.
- GARLICK, DR. J. H.**, formerly of the Eastern State Hospital, appointed Second Assistant Physician at the Central State Hospital, Petersburg, Va.
- GOODFELLOW, DR. E. H.**, resigned as Assistant Physician at the Eastern Michigan Asylum, Pontiac, Mich.
- GOUX, DR. L. J.**, resigned as Assistant Physician at the Eastern Michigan Asylum, Pontiac, Mich.
- HESSLER, DR. ROBERT**, formerly Assistant Physician at the Northern Indiana Hospital for Insane, Logansport, appointed Pathologist at the Central Hospital for Insane, Indianapolis, Ind.
- HILL, DR. SAMUEL S.**, formerly First Assistant Physician, appointed Acting Superintendent of the State Asylum for the Chronic Insane of Pennsylvania, Wernersville, Pa.
- HOLLEY, DR. EWING**, appointed Medical Interne at the Manhattan State Hospital, New York City.

- HOLMES, DR. C. M., promoted to be First Assistant Physician at the Northampton Lunatic Hospital, Northampton, Mass.
- HOLT, DR. JOHN M., appointed Junior Assistant Physician at the Manhattan State Hospital, Ward's Island, New York City.
- HOUSE, DR. WILLIAM, resigned as Assistant Physician at the Manhattan State Hospital, Ward's Island, New York City.
- HOUSTON, DR. J. A., promoted to the Superintendency of the Northampton Lunatic Hospital, Northampton, Mass.
- HUTCHINSON, DR. W. G., appointed Assistant Physician at the Eastern Michigan Asylum, Pontiac, Mich.
- KLEIN, DR. EDWARD G., appointed Medical Interns at the Willard State Hospital, Willard, N. Y.
- LOVELACE, DR. ELIZABETH N., appointed Assistant Physician at the Philadelphia Hospital, Philadelphia, Pa.
- MACALLISTER, DR. ELEANOR, appointed Woman Physician at the Manhattan State Hospital, New York City.
- MACGREGOR, DR. W. W., appointed Superintendent of the Southwestern Insane Asylum, San Antonio, Texas.
- MANCHESTER, DR. G. H., resigned as Assistant Superintendent at the Protestant Hospital for the Insane, Montreal, Quebec.
- MARSHALL, DR. DAVID T., appointed Medical Interns at the Manhattan State Hospital, New York City.
- MELLEN, DR. SAMUEL F., resigned as Assistant Physician at the Willard State Hospital, Willard, N. Y.
- MUIR, DR. A. PARKER, appointed Junior Assistant Physician at the Manhattan State Hospital, Ward's Island, New York City.
- NIMS, DR. E. B., resigned the Superintendency of the Northampton Lunatic Hospital, Northampton, Mass.
- NORRIS, DR. CHAS. E., appointed Junior Assistant Physician at the Manhattan State Hospital, Central Islip, N. Y.
- O'HANLON, DR. GEORGE, resigned as Assistant Physician at the Willard State Hospital, Willard, N. Y.
- PARKER, DR. FLAVIUS, formerly Second Assistant Physician at the Rochester State Hospital, Rochester, N. Y., promoted to be First Assistant Physician at the Long Island State Hospital, King's Park, N. Y.
- PARSONS, DR. PAYN B., appointed Medical Interns at the Northampton Lunatic Hospital, Northampton, Mass.
- PIERCE, DR. APPLETON H., resigned as Assistant Physician at the Worcester Lunatic Hospital, Worcester, Mass.
- PITTS, DR. GODFREY, appointed Medical Interns at the Willard State Hospital, Willard, N. Y.
- SPRAGUE, DR. GEORGE P., promoted to be First Assistant Physician at the Danvers Lunatic Hospital, Danvers, Mass.
- STEVES, DR. JAMES A. E., resigned as Assistant Superintendent of the Provincial Lunatic Asylum, St. John, N. B.
- TACKETT, DR. J. R., resigned as Assistant Physician at the East Mississippi Insane Asylum, Meridian, Miss.
- TAYLOR, DR. W. E., appointed Superintendent of the Illinois Western Hospital for the Insane, Watertown, Ill.
- TRIPP, DR. GEORGE A., appointed Assistant Physician at the Worcester Lunatic Hospital, Worcester, Mass.
- WARD, DR. FREDERICK S., formerly Assistant Physician, appointed Pathologist at the Taunton Lunatic Hospital, Taunton, Mass.
- WILTON, DR. TERTIA C., appointed Assistant Physician at the Taunton Lunatic Hospital, Taunton, Mass.

Books and Pamphlets Received

- A Manual of Jurisprudence. By Alfred Swaine Taylor, M. D., Lond., F. R. S. Revised and edited by Thomas Stevenson, M. D., Lond., F. R. C. P. Twelfth American edition with citations and additions from the twelfth English edition, by Clark Bell, Esq., LL. D. 8vo, 834 pages. Lea Brothers & Co., Phila.
- A Practical Treatise on Sexual Diseases of the Male and Female. By Robert W. Taylor, M. D. 8vo, 448 pages. Lea Brothers & Co., Phila.
- Addresses Delivered at the Opening of the Walter Garrett Memorial Building of the Pennsylvania Hospital, April 23, 1897. 47 pages, 4to.
- The Insane in Private Dwellings and Licensed Houses. By J. F. Sutherland, M. D., F. R. S. E. 2d edition. 1897. 8vo, 60 pages. E. and S. Livingstone, Edinburgh.
- The Charities Record: A journal of the progress of Baltimore's charities. Published by the Charity Organization Society. Vol. iii, No. 2. 4to. 1897.
- Training Schools for Nurses in Hospitals for the Insane. By P. M. Wise, M. D. 8vo, 11 pages. Reprinted from American Journal of Insanity, vol. liv, No. 1, 1897.
- General Questions of Auto-Infection. By C. K. Clarke, M. D. 8vo, 8 pages. Reprinted from American Journal of Insanity, vol. liv, No. 1, 1897.
- Notes on the Epileptic Aura, with Report of Some Rare Forms. By L. Pierce Clark, M. D. 8vo, 6 pages. Reprinted from American Journal of Insanity, vol. liv, No. 1, 1897.
- The Psycho-motor Problem. By Herbert Nichols. 8vo, 22 pages. Reprinted from American Journal of Insanity, vol. liv, No. 1, 1897.
- Clinical Aspects of Auto-Intoxication. By Arthur W. Hurd, M. D. 8vo, 13 pages. Reprinted from American Journal of Insanity, vol. liv, No. 1, 1897.
- Advances in Neurology and Their Relation to Psychiatry. By B. Sachs, M. D. 8vo, 19 pages. Reprinted from American Journal of Insanity, vol. liv, No. 1, 1897.
- "The Relation of Insanity to the State." Paper read by Dr. James Russell. 8vo, 1897, 16 pages. Times Printing Co., Hamilton.
- "The After Effects of Surgical Procedure on the Generative Organs of Women for the Relief of Insanity." Paper read by Dr. James Russell. 8vo, 16 pages, 1897. Times Printing Co., Hamilton.

- The Nature of the Leucocytosis Produced by Nucleinic Acid; A Preliminary Experimental Study. Presented to the Section on Materia Medica, Pharmacy and Therapeutics, at the Forty-eighth Annual Meeting of the American Medical Association, Phila., Pa., June 1-4, 1897. By Delano Ames, A. B., M. D., and A. A. Huntley, M. D. 12mo, 1897, 19 pages. Reprinted from The Journal of the American Medical Association, September 4, 1897.
- Psychological Medicine (1837-1897). By Sir James Crichton-Browne, M. D., LL. D., F. R. S., Lord Chancellor's Visitor in Lunacy; and A. R. Urquhart, M. D., Physician-Superintendent, James Murray's Royal Asylum, Perth. Reprinted from the Practitioner for June, 1897.
- Seventieth Annual Report of James Murray's Royal Asylum, Perth, 1897. Excelsior, being the quarterly magazine of James Murray's Royal Asylum, Perth, July, 1897.
- Circumcision, with a description of a pair of circumcision forceps. By A. L. Hodgdon, M. D., Dispensary Physician to the Department of Nervous Diseases, College of Physicians and Surgeons, Baltimore. Reprinted from Maryland Medical Journal, July 17, 1897.
- The Hemiplegic State and its Treatment. By Archibald Church, M. D., Professor of Neurology, Chicago Polyclinic, etc. Reprinted from the Chicago Medical Recorder, June, 1897.
- Cheyne-Stokes Respiration Phenomena. By N. S. Davis, Jr., M. D., Chicago. Reprinted from the Journal of the American Medical Association, July 24, 1897.
- The Cardio-Vascular and Renal Relations and Manifestations of Gout. By N. S. Davis, Jr., M. D. Reprinted from the Journal of the American Medical Association, 1897.
- Is there ever a Serous Iritis without an Involvement of the Ciliary Body or Choroid, or Both? By William Cheatham, M. D. Reprinted from Ophthalmic Record, 1897.
- Insanity as a Neurosis. Medical, Scientific and Educational Work at the Illinois Eastern Hospital for the Insane, under the superintendency of Clarke Gapen, M. D., LL. B. Reprinted from the Tenth Biennial Report of the Hospital.
- Eighty-third Annual Report of the Trustees of the Massachusetts General Hospital. Including the General Hospital in Boston, the McLean Hospital and the Convalescent Home at Waverley, 1896. Boston, The Barta Press, 1897.
- The Royal Victoria Hospital, Montreal. Third Annual Report for the year ending 31st December, 1896. Montreal: Morton, Phillips & Co.
- Urate Disease. Paper read before the Franklin County, Maine, Medical Association, September 14, 1897. By T. D. Myers, M. D., of Phila., Pa. 4to, 8 pages. Reprinted from the Journal of Medicine and Science.
- A Case of Acromegaly: Autopsy: Skeleton. Part II. Pathology and Etiology. By O. T. Osborne, M. D. 4to, 15 pages. Reprinted from Yale Medical Journal, December, 1897.

- A Case of Acromegaly: Autopsy: Skeleton. By O. T. Osborne, M. D. 4to, 16 pages. Reprinted from the Transactions of the Association of American Physicians, 1897.
- A Case of Acromegaly. By O. T. Osborne, M. D., 8vo, 8 pages. Reprinted from the American Journal of the Medical Sciences, June, 1892.
- Morbid Besetments or Obsessions. By C. B. Burr, M. D., Flint, Michigan. 8vo, 6 pages. Reprinted from the Physician and Surgeon, Detroit and Ann Arbor.
- Autogenous Poisoning in Disease. By E. D. Bondurant, M. D., Mobile, Ala. 8vo, 12 pages. Reprinted from November, 1897, number of the New Orleans Medical and Surgical Journal.
- Feeble-Minded Children in the Public Schools. By Will S. Monroe. 8vo, 12 pages. [An address read before the Association of Medical Officers of American Institutions for Idiotic and Feeble-Minded Persons at Fort Wayne, Indiana, May, 1894, and reprinted from the Proceedings of the Association.] Westfield, Mass., 1897.
- Difficulties in Determining the Causes of Coma. By J. T. Eskridge, M. D., Denver, Colo. 8vo, 19 pages. Reprint from The Annual Report of the Colorado State Medical Society.
- Angina Pectoris: its Relation to Dilatation of the Heart. By J. H. Musser, M. D. 8vo, 9 pages. Reprinted from the American Journal of the Medical Sciences, September, 1897.
- The Prognosis and Duration of Attacks of Mental Disease. By Henry R. Stedman, M. D., Boston. 8vo, 12 pages. Reprinted from the Boston Medical and Surgical Journal, June 10, 1897.
- The Public Care of the Insane in Massachusetts. By J. L. Hildreth, M. D. 8vo, 43 pages. An address delivered before the Middlesex South District Medical Society at its annual meeting, April 21, 1897. Printed at the Riverside Press, Cambridge, 1897.
- The Early Diagnosis of Progressive Paresis. By Dr. Hoche, Strassburg. 8vo, 31 pages. Reprint from Alienist and Neurologist, January, 1898.
- Syphilis of the Central Nervous System. By Sydney Kuh, M. D. 8vo, 28 pages. Reprint from Alienist and Neurologist, October, 1897.
- What Constitutes an Insane Criminal, and What Status does he Occupy? By H. E. Allison, M. D. 8vo, 14 pages. Reprinted from the Albany Medical Annals of December, 1897.
- Method of Securing Health of Insane Convicts. By H. E. Allison, M. D. 8vo, 12 pages. Reprinted from the Journal of Social Science for December, 1897.
- The Formation of a National Association or Society for the Study of Epilepsy and the Care and Treatment of Epileptics. Opinions and Suggestions bearing on its Formation and Purposes. By William P. Spratling, M. D., Sonyea, N. Y. 8vo, 16 pages.
- Mr. Enoch Pratt's Bequest to the Sheppard Asylum. 1898. 8vo, 10 pages. Health Department, Criminal Court Building, New York City. Preventive Medicine in the City of New York. The Address in Public

- Medicine delivered at the 65th Annual Meeting of the British Medical Association, in Montreal, Canada, September, 1897. By Hermann M. Biggs, M. D. 8vo, 30 pages.
- Headaches from Nasal Causes. By Sargent F. Snow, M. D. 8vo, 11 pages. Reprinted from the Medical News, July 10, 1897.
- Report of a Case of Intradural Spinal Tumor extending through the Foramen Magnum, compressing the Extreme Upper Portion of the Cord, and almost completely Destroying it at the Third Cervical Segment. By J. T. Eskridge, M. D., of Denver, Col. 8vo, 17 pages. Reprinted from the Medical News, September 25, 1897.
- Two Cases of Homicidal, Amnesic, Transitory Frenzy. By Charles P. Bancroft, M. D. 16mo, 24 pages. Reprinted from the Boston Medical and Surgical Journal of October 14, 1897.
- The Development of the Insane Asylum. By Helen W. Bissell, M. D., St. Paul. 24mo, 11 pages. Reprinted from Northwestern Lancet.
- The Medical Service of Hospitals. By Henry M. Hurd, M. D. 8vo, 5 pages. Reprinted from the Albany Medical Annals of February, 1898.
- Massage, Movements and Bandaging in the Treatment of Displaced Semilunar Cartilages. By Douglas Graham, M. D., of Boston, Mass. 8vo, 12 pages. Reprinted from the American Journal of the Medical Sciences, November, 1896.
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